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THE MENTAL COMPLICATIONS OF HEART DISEASE*

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OUR attention was lately redrawn to the subject of mental changes in heart disease by a case with the following history.

A man aged 47, an alcoholic with aortic lues and lues of the central nervous system was admitted to the Montreal General Hospital on March 8, 1937, with congestive cardiac failure.

He had some renal impairment and a moderate icterus and had had considerable digitalis therapy. He was slightly confused. He received salyrgan on March 14th, which was followed by diuresis, and on March 17th developed a psychosis with a paranoid trend. He had received morphia, nembutal and chloral. There was fever at the onset of his illness, with a slight bronchopneumonia. He was discharged to a mental hospital and died three months later.

Here was a problem in diagnosis. Of all the possible causes for the development of mental illness, which one was responsible for his breakdown? Central nervous system lues, alcohol, digitalis, uræmia, sudden dehydration, liver toxæmia, morphine, barbiturates, pneumonia? Each several factor has from time to time been looked upon as the essential element in the mental changes which undoubtedly may occur in the course of heart disease.

To endeavour to reach a solution, or at least a suggestion toward a solution, the last 300 cases of heart disease admitted to the Montreal General Hospital were gone over with the hope that we might secure some lead which would be of service in helping us to a conclusion in the future.

Of the 300 cases of heart disease, taken as they came, the following are the gross statistics.

		Percentage
Male	186	62.0
Female	114	38.0
Age—Over 50	196	65.0
Under 50	104	35.0
Cases with cardiac failure	190	
Cases without cardiac failure	110	
Cases above 50 with cardiac failure	136	
Cases below 50 with cardiac failure	60	

From this group of 300 another group was separated.

			Percentage
Cases with mental changes		62	20.3
Male		47	
Female		15	
Ages—			
Under 30		1	2.0
30 – 40		5	9.0
40 – 50		14	22.0
50 – 60		18	28.0
60 – 70		14	22.0
Over 70		10	17.0
Etiology—			
Hypertensive cardiovascular disease		30	
Rheumatism		12	
Syphilis		9	
Arteriosclerosis		12	
With cardiac failure			
Recent	7	52	80.0
Of long duration	45		
Without cardiac failure		10	17.0
With cerebral vascular disease		22	35.0
With coronary artery disease			
Anginal syndrome	15	29	46.0
Occlusion	14		
With changes in ocular fundi		24	38.0
With renal impairment		27	44.0
With psychopathic history, personal or family		11	17.0
With an alcoholic history		24	38.0
History of digitalis Medication			
Intensive 35 51%		46	74.0
Occasional 11 17%			
" morphia		34	52.0
" barbiturates		29	46.0
" bromides		8	12.0
" salyrgan diuresis		4	6.0

* From the Department of Medicine of the Montreal General Hospital.

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In the 62 cases of mental disturbance there were the following clinical types.

		Percentage
Confusion in	50	80.0
Abnormal irritability	26	41.0
Delirium	29	46.0
Hallucinations	13	20.0
Mania	6	10.0
Paranoid features	4	6.0
Mortality in the group of 62 cases with mental symptoms	43	70.0
Mortality of all 300 heart cases	83	27.0

Before attempting to draw any conclusions from these figures it is only fair to say that the cases concerned are the "run of mine" of a general hospital with an active service in a seaport city with a large floating population from many nations and a settled population of French- and English-speaking people.

The mental complications of heart disease received but occasional attention up to about fifty years ago when a number of articles on the subject began to appear,[1, 2, 3, 4] and there has not been, nor is there now, a unanimity of opinion concerning either their frequency or their etiology, and some even scout their existence as clinical entities. A review of some of the opinions held about it may be of service.

An interesting observation was made in 1885 by J. H. Douty,[3] a British Army Medical Officer, who reported 14 cases of aortic regurgitation in which mental disease appeared. Eleven had mania, 1 melancholia and 2 dementia, and none of them recovered. One of the cases suffered also from general paralysis but syphilis was not mentioned as a possible cause. The association of an altered mental state with aortic regurgitation has been noted fairly frequently in medical literature.

Mickle[4] in the Goulstonian lectures for 1888 describes many instances of heart disease with mental disease. In some the heart disease preceded, in some followed, the mental alienation, and since he wrote as the medical superintendent of a mental hospital and all of his cases would be mentally ill, his observations only indirectly concern us here, but he noted that in a general way that the patient with mitral disease was likely to be morose and depressed, the one with aortic disease more manic and troublesome. As a commentary on, or a miniature of the subject, one might refer to the Adams-Stokes syndrome, in which a transient heart failure may give rise to very definite cerebral symptoms, epileptiform, syncopal or apoplectiform, and, in one case which I recall, to acute mania at the time of the heart-block, and in one such attack the patient died while struggling with his attendants.

In the Goulstonian lectures for 1901 on mental changes that accompany visceral disease, Henry Head[5] would attribute the changed mental states occurring in heart disease to the effects of visceral pain reflected from the heart along the fibres of the sympathetic through the ganglion of the posterior root into the central nervous system, and through the vagus connections with the 5th nerve. He postulates a superficial tenderness of the scalp which is associated with certain changes of mood, which may become fixed. In a most laborious and detailed clinical examination Head comes to these conclusions. Patience and the infinite capacity for taking pains are not characteristic of this generation, and few of us would make the effort which would be necessary to substantiate these conclusions.

Riesman,[6] in commenting on Head's views, attributes the hallucinations of heart disease to actual cerebral responses to anæmia or circulatory disturbance; he thinks that they are only temporary and do not affect the prognosis, and considers the most common cardiac psychosis to be a confusion, often appearing as the patient wakes out of sleep. He also refers to a state of excitation or disorientation in elderly persons with myocardial disease.

He quotes the case of a man of 50 with auricular fibrillation and acute cardiac failure. He improved under digitalis but developed an acute mania in which he died. Another case with aortic stenosis of rheumatic origin developed delusions of being poisoned by gas-engines. These disappeared under rest. As reasons for the appearance of mental symptoms in cardiac disease he suggests: (*a*) coincidence in a person of psychopathic make up; (*b*) uræmia; (*c*) acidosis; (*d*) drugs and poisons; and here he raises the very contentious subject of digitalis as a cause of mental change in cardiopaths; but before going further into this question the views of some others on the whole subject of cardiac psychosis may be considered.

J. I. France[7] presented the view that disturbance of the heart's action produced a mental and emotional state quite apart from fear or worry about the disease itself, and

quoted the case of a man who on the appearance of decompensation in mitral disease became depressed and later developed delusions which became fixed. "The first mental symptoms of cardiac disease occur during sleep and as the heart disturbance is increased the mental change is carried over into the waking hours." He suggests that certain dream states in which the patient reproaches himself for duties undone may have a cardiac origin.

A. G. Gibson,[8] of Oxford, mentions that pericarditis in children sometimes produces querulousness and neurasthenia, and in this connection suggests that John Hunter's fits of anger might be explained on the ground of his coronary attacks; though it is quite probable that Hunter, like Horace Greely, controlled more temper in five minutes than the ordinary man did in a fortnight. Gibson states that in 153 cases of heart disease among 2,000 autopsies the histories showed 15 cases, or 9.8 per cent, who had mental disturbances, whereas in 127 cases of heart disease in private practice there were 32 cases, or 20 per cent.

Carey Coombs[9] made the statement that he was struck by the absence of any unimpeachable evidence from his own experience to prove that heart disease could directly cause mental disorder and submitted the following questions. (1) Is there any evidence that mental disorder causes cardiac disease? (2) Do circulatory disturbances arising from cardiac disease often upset the mental functions? (3) How far do the coincidences of cardiac disease with mental disease owe their origin to some common cause? In answer to the second question he suggests—rheumatic cardiac disease is a form which while the circulation through the brain is hampered is less complicated than are other circulatory diseases by cerebral vascular disease, which introduces another factor. In 1,000 cases of rheumatic heart disease, half of which were advanced, he only found 10 examples of serious mental disturbance. His final answer is that insanity is not more common in these cases of rheumatic heart disease than it is among the general population.

In the diseases causing coincident damage of the heart and brain, such as thyrotoxicosis, syphilis and chorea he saw little evidence of mental damage in heart disease, but in the arteriosclerotic group he found a number, but attributed these to the aging of tissue common to both heart and brain, and does not regard these as mental disease caused by heart disease unaided; a quite logical if restricted conclusion.

An article by Wolff and Curran[10] throws some light upon some features of this problem. In it they discuss "The dysergastric reactions", meaning psychic disorders due to inadequate support from or metabolism of the brain. In 106 patients in whom this reaction was brought about by 27 noxious agents of the widest variety no evidence was found that there were any specific relationships between a particular noxious agent and the form and content of the accompanying psycho-biological disturbance. Variability was the dominant feature. Lack of sustained attention, fear or anxiety, suspicion, hallucination, and restlessness were the prevailing manifestations, and the psychobliological content of the dysergastric state depended on the individual equipment and experience of the individual. And on this ground one may presume that digitalis, barbiturates, the uræmic state or anoxæmia may each be a disturber of the mental peace, and intensity and duration, rather than the individuality of the agent is the prime factor in the result.

H. O. Hall,[11] of Washington, influenced by Duroziez' report of 20 cases previously, drew attention to the causation of delirium by digitalis in a cardiac patient, and Hirschfelder and Babcock influenced by Hall, quoted other instances. H. L. Smith[12] reports an instance of digitalis poisoning in which a man of 72 who had received 40 c.c. of the tincture in 2 weeks became restless, irritable and confused, and two or three days later, coloured vision appeared. In this instance everything looked white. The patient later became delirious and noisy and was treated by discontinuance of the digitalis and by sedatives, and began to improve after three days. His pulse was 84 and he had many premature ventricular contractions. Willius, commenting upon this case, mentions that digitalis delirium may come on without the other manifestations of poisoning by digitalis, such as nausea, vomiting and delayed conduction. Smith states that at the Mayo Clinic up to 1931 there had been over 50 cases of digitalis delirium, and as a rule they occurred in people with arteriosclerosis and who had received large amounts of the drug.

W. Hamburger[13] reported a number of patients with heart disease as developing mental

symptoms and mentioned as common factors that all had advanced and recurring heart failure, and the confusional states coincided with severe decompensation. All were over 45, and associated cerebral arteriosclerosis could be presumed. All blood pressure readings were above 170 mm., systolic. Each presented an additional cause in some drug, such as digitalis, alcohol, belladonna, quinidine or lead. He concluded that the development of these confusional states may be due to the effects of these drugs on a person whose circulation is embarrassed by widespread tissue changes, and suggested that in cardiac decompensation medication should be cautious, with doses less than the average, and should be withdrawn if confusion appears, and hydrotherapy and isolation substituted for sedative drugs.

J. I. Carr[14] reported the case of a man of 54 with cardiac failure who received 100 grains of digitalis and became irrational and noisy; the drug was stopped and the delirium disappeared and recurred upon its resumption. Another patient, an elderly man who had taken digitalis over a long period, with a resulting drop in the pulse rate and the onset of vomiting, became surly and irrational and disoriented, with blurring of vision. Carr concludes that the diagnosis of digitalis delirium rests upon a history of the administration of large amounts of the drug over a long interval, the absence of other cause, the presence of other signs of digitalis intoxication, the onset of delirium as decompensation recedes, and the clearing of the mental state when digitalis is withdrawn. In this connection Soma Weiss[15] takes the view that the psychosis seen in patients after digitalization, in contrast to cardiac slowing, emesis and coloured vision, is not the result of a direct action of digitalis on nerve structures, but rather of sudden changes in a chronically impaired cerebral circulation and of chemical changes associated with the removal of large amounts of long standing œdema. In support of this view he cited the following cases.

1. A patient with cardiac failure and much œdoma was rapidly digitalized with disappearance of his œdema, and coincidently became excited, disoriented and violent, and had a convulsion. The psychosis lasted two days. Weiss looked upon the rapid dehydration rather than the digitalis as the cause of the psychosis.

2. Another man with congestive failure was given 6 grains of digitalis leaf daily for six weeks and had nausea for two weeks and coloured vision for three weeks, during which he saw yellow, blue and purple. He showed no psychosis. In hospital the digitalis was discontinued and theocin and magnesium sulphate were given, and in four days the œdema disappeared as well as the nausea and coloured vision, but he developed a psychosis for three days and again became normal and was given 1½ grs. of digitalis daily and remained mentally normal. Three months later he developed congestive failure again and took several digitalis pills daily for five weeks and yellow vision again developed and the heart showed a coupled rhythm. Under diuretics he lost his œdema and he again developed a psychosis which cleared up. He again developed failure and was given digitalis and diuretics, but the œdema continued and death ensued but delirium did not appear.

3. A third patient, an arteriosclerotic with decompensation, developed a psychosis which cleared up in two days. She then received digitalis with no recurrence of her mental disturbance.

4. Another decompensated patient under digitalis became noisy and irrational. The digitalis was continued and the mental condition improved.

While these cases strongly uphold the view that rapid disappearance of œdema and not digitalis *per se* was responsible for the psychosis, one might ask if the sudden flooding of the circulation with digitalis bodies in the process of dehydration might not in itself be a reason for the psychosis, especially since in the second case there were very apparent cardiac and neural toxic effects of digitalis already in operation.

G. L. Moench[16] reports 3 cases in which the administration of digitalis over a period of time was followed by excitement, irritability and restlessness, in one case by depression, an attempt at suicide in a second, and acute mania in a third, and in all of these the symptoms subsided on removal of the drug.

The use of barbituric acid compounds undoubtedly leads in some instances to mental changes in heart disease, but rarely I think to violent episodes. The barbital user is depressed, inactive, physically and mentally confused, with slurred speech and defective memory, and becomes disturbed readily over trifles.

Gruber and Roberts[17] conclude that all barbituric acid derivatives cause dilatation of cerebral vessels, while Pickworth[18] has this paragraph, which from the clinical standpoint says much in few words, "We ourselves noticed that quite small daily doses of veronal caused a lively, clean and contented cat to become sullen, miserable and unkempt."

J. Wortis[19] studied 25 cases of psychoses in heart disease on the psychiatric service of Bellevue Hospital, and found that they were mainly characterized by confusion, anxiety and delusions of persecution, and were often talkative and circumstantial. He concluded that anxiety is a body state and can be provoked by physical disease, that anxiety may induce delusions of persecution, and that these are dependent on the

degree of associated confusion. Wortis also concluded that psychosis in heart failure was of grave prognostic significance, as out of 19 cases traced, 16 had died within two years.

The following table summarizes the evidence deducible from the group of cases which we have analyzed.

	With mental changes percentage	*Without mental changes percentage*
With renal impairment.....	44.0	12.0
Prolonged digitalization	51.0	18.0
Over 50 years of age	67.0	64 0
Death in hospital	70.0	17.0
With cardiac failure	83.0	57.0
Coronary artery disease	46.0	26.0
Cerebral vascular disease	35.0	7.0

Coronary disease, cerebral vascular disease, renal impairment and auricular fibrillation were each present in one-third to one-half of the cases showing mental changes, while a psychopathic family or personal history was only found in one-sixth of the cases. Alcoholism was present in one-third.

It may be said, in summary, that after 50, increased age does not influence the onset of mental changes in cardiac disease.

Structural defects in the cardiovascular and renal apparatus, as well as functional breakdown, are uniformly more common in the group showing mental changes than in the group which does not show mental changes, and this is demonstrated by the appearance of cardiac failure in 83 per cent of the cases showing mental changes as compared with 57 per cent in the group not showing mental changes.

Renal impairment evidenced by an elevation of the blood urea occurred in 44 per cent of the group showing mental changes and in 20 per cent of the cases without mental changes.

Clinical evidence of cerebral vascular disease was found in 35 per cent of the cases showing mental changes as compared with 7 per cent in the group showing no mental changes. Evidence of disease of the coronary arteries was present in 46 per cent of the cases showing mental changes as compared with 26 per cent in those showing no mental changes.

Of the group showing mental changes 70 per cent died in hospital, while of cases showing no mental changes 17 per cent died in hospital.

These figures are subject to the fallacy inherent in small numbers, but the differences in the percentages in the two groups are so great as to leave one with the strong impression that in a large proportion of cases the manifestations of mental disturbance in heart disease are also manifestations of the process of physical dissolution, and one may be permitted to draw a parallel between these phenomena and those often seen in impending death.

Prolonged digitalization was distinctly more frequent in the mentally disturbed group than in those showing no mental symptoms, and, though this may be explained by the greater frequency of cardiac failure in the group with mental symptoms, the discrepancy is so great that one must seriously consider digitalis as *particeps criminis* in the production of mental changes in heart disease. Salyrgan diuresis has not with us been found to be a notable precursor of mental disturbance.

Finally, the important "noxious agent" in the dysergastic reaction in the nervous systems of cardiopaths, from our observations, is the dilapidation and breakdown of the circulatory apparatus. This view influences our prognosis and our therapy. The general experience is that such cases show a very high mortality, and the more severe and persistent the mental alienation, the graver the prognosis.

In treatment the deduction would be that all the tried measures employed in the salvage of the cardiopath are logical and advisable, such as rest, digitalis, diet and diuresis, but with a caution against too prolonged and potent digitalis administration and too sudden and too severe diuresis, as observant and prudent clinicians have been convinced that each of these procedures has been followed by the onset of psychical storms.

The medicinal treatment, as Janeway remarked of the treatment of the advanced nephritic, "frequently resolves itself into a choice of sedatives".

The preparations of opium will usually be the sheet anchor, although always given with a sense of regret.

There is a low lingering curse attached to all the barbiturates, well epitomized in a quotation made before, that their experimental use "had caused a lively, clean and contented rat to become sullen, miserable and unkempt". And this applies not only to cats, but sometimes, given under the skin or into a vein, they may be the lesser of two evils. In some instances,

especially in the manic or paranoid states, commitment to a mental hospital is necessary.

Taken all together, the problem put to the one in charge of such a patient is not different from that put to the doctor by Macbeth when he asked of him that he would "with some sweet oblivious antidote cleanse the stuffed bosom of that perilous stuff that weighs upon the heart". You will remember that to the doctor's rather lame reply "Therein the patient must minister to himself" Macbeth countered with the words "Throw physic to the dogs! I'll none of it!"—and who can blame him?

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HEAD INJURIES: A TREATISE ON THE PATHOLOGY, SEQUELÆ, AND MEDICO-LEGAL ASPECTS*

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THE diagnosis in a case of head injury can sometimes be very difficult. The degree of the injury can only be estimated by continuous and close attention to the physical signs and symptoms in the period immediately following the injury. These physical signs and symptoms are simply the indicators of the underlying pathological conditions which are taking place within the skull. Therefore it is most essential to have a fundamental knowledge of the reaction to intracranial injury. It would be well to state our interpretation of the pathological developments accompanying the three clinical states of head injuries, *viz.*, concussion, contusion-laceration, and compression—acute and delayed. A fundamental knowledge of these pathological processes is also essential in giving a prognosis and in estimating the seriousness of the various after effects.

PATHOLOGICAL PHYSIOLOGY

Concussion.—The skull possesses the quality of elasticity to a small degree. On this account it is able to undergo temporary changes in shape without fracturing. No matter what part of the skull is struck the blow is transmitted to the parts beneath. The brain is completely surrounded by cerebrospinal fluid situated beneath the arachnoid coat, which acts as a cushion, protecting that part of the brain immediately below the site of the blow from direct injury. The basic physical laws of Charles and Boyle state that "force or pressure in fluids is transmitted equally in all directions". The force of the blow, therefore, which is transmitted to the cerebrospinal fluid is carried equally in all directions and its effect is felt over a large surface of the cerebral hemispheres. The falx cerebri which separates the two hemispheres offers little resistance to this force. As the cranium cannot expand, this pressure is exerted upon the surface of the brain, which is covered by very thin pia mater. This coat holds in its meshes the superficial blood vessels, and, more important, the very fine capillary system of the cortex lies directly beneath it. The force of any blow to

* This paper is complementary to one entitled "Head injuries: A treatise considering the accidents of the day", *Canad. M. Ass. J.*, 1938, **39**: 338.

the head, therefore, results in a widespread effect over the surface of the cerebral cortex. This pressure is sufficient to compress the superficial capillary circulation and the cortex is thereby rendered instantaneously anæmic.

Cushing's classical experiment helps us to understand these conditions, clinically. He inserted a window in the skull of a dog and watched the effect of varying degrees of pressure. When the pressure of the cerebrospinal fluid was increased sufficiently to produce an anæmia of the cortex the animal lapsed into an unconscious and paralytic state; when negative pressure was applied and the cortex was rendered hyperæmic the animal reacted by becoming very irritable and excited. He laid it down, therefore, as a principle that anæmia of the brain was associated with paralytic symptoms and that a hyperæmia of the brain, with its accompanying œdema, was associated with symptoms of irritation.

Immediately after the effects of the blow the pressure on the capillaries is relieved, to be succeeded by a rebound aspiration of blood into the empty capillaries, so that there is an actual increase over the normal volume of blood in the cortex. In the tissue immediately around these hyperæmic capillaries a degree of œdema is produced. This unbalanced circulation will take a variable time to again stabilize itself, depending upon the severity of the blow with its proportionate disturbance of the circulation and the degree of resulting œdema. It follows that when the circulation is stabilized and the œdema absorbed recovery is complete. These are the conditions in the state of concussion and it will be noted that there is no organic damage done to the brain substance but simply a disturbance in the superficial blood vessels of the cortex with the accompanying œdema. To produce unconsciousness, it has been shown that over one-third of the cortex must be rendered anæmic. The duration of the unconscious period must depend upon the force of the blow and its consequent disturbance of circulation and the production of œdema over a varying area of cortex. Cases, therefore, of five minutes' duration must have a small area of disturbance and the circulation quickly rights itself; cases with unconsciousness for several days must have a very large area of the cortical circulation disturbed, with much œdema.

Contusion-laceration.—In the state of contusion-laceration the force applied to the skull has been too severe to be taken care of by the cushion of cerebrospinal fluid. That part of the brain, therefore, which lies immediately below the site of the blow will be damaged in proportion to the severity of the blow. In slight cases the meninges only may be torn. In more severe cases the surface of the brain will be contused, and the many venous channels which lie beneath the pia mater on the surface of the brain may be lacerated. This will cause an outpouring of blood into the cerebrospinal fluid in the subarachnoid space, and it is in these cases that blood will be found on lumbar puncture. It is our experience that this blood can be found on lumbar puncture about thirty minutes after the injury. More severe blows will cause damage in the substance of the brain along the line of force, causing minute, pin-point hæmorrhagic areas. The severest cases, which sometimes prove fatal, have a contre-coup injury on the opposite pole of the brain. One can imagine, therefore, that in contusion-laceration all degrees of damage are done, from the small laceration of the meninges with a little venous hæmorrhage, to the severe contusion-laceration of the brain substance at both poles. With all these injuries a proportionate degree of œdema develops, which magnifies the severity of the injury so that a localized blow will have a widespread effect throughout the brain substance. One must remember that on the surface of the brain, with the exception of the middle meningeal arteries, there are nothing but veins, and the hæmorrhage from these veins will be of very low pressure, approximately 5 mm. One can understand, therefore, that it requires a very little increase of intracranial pressure to control this bleeding.

Compression.—The state of compression is associated with the pathological state of hæmorrhage. We have noted that hæmorrhage from the veins within the skull is of a very low force and that intracranial pressure is soon able to control such hæmorrhage. However, the pressure in the cerebrospinal fluid and that of the brain substance is a little below that of the veins, and it is conceivable that hæmorrhage from the larger venous channels may become quite large in amount. It has been shown that the brain can be compressed to three-quarters of its volume without an increase in intracranial pressure, providing that the hæmorrhage has been very slow in development. All fluids are slowly expressed without increasing the pressure on the brain substance.

Hæmorrhage from the arteries, on the other hand, comes with a pressure of about 150 mm. and these hæmorrhages are fast in development and large in amount. This great difference in the pressure within the arteries and that within the veins is taken care of by the difference in the bore of the arterial inlet of the skull as compared with the bore of the venous outlet. The fast-flowing rivers of the arteries empty their blood, as it were, into a large venous lake.

Most of the arteries within the skull are well protected, lying in the base and within the substance of the brain. However, there are three places where the arteries are subject to direct injury; two of these are the temporal regions where the middle meningeal arteries are subject to direct injury, and the third is the opening in the tentorium cerebelli. If one examines the tentorium it is found to be a very strong, unyielding double fold of dura mater. The edges of the opening are much thickened and its four rigid pillars run forward, to be attached to the clinoid processes. Through this opening pass the posterior cerebral arteries and the midbrain, surrounded by membranes and cerebrospinal fluid. It is the experience of our Pathological Department that cases of head injury that come to autopsy show this to be a site of injury in practically every case. In elderly people with arterial disease the cause of the quick deaths following a head injury is found to be hæmorrhage from the posterior cerebral arteries and damage within the substance of the pons and midbrain. The pyramidal and sensory tracts and the bilateral red nuclei are, as a rule, damaged, and as these are the paths of coordination between the cerebrum, cerebellum, and the vital centres of the medulla it can readily be understood why sudden death quickly follows the injury.

In addition to what actual damage may be done to the brain and its membranes increase of intracranial pressure is the most feared and serious development. The causes of this are: (*a*) hæmorrhage, and (*b*) acute spreading œdema.

Hæmorrhage has two detrimental effects. We know that it is definitely an irritant to serous membranes and it increases the volume of the cerebrospinal fluid and, therefore, intracranial pressure. Blood always gravitates quickly to the base of the brain, where it comes in contact with the midbrain and the basal nuclei. It is a well known observation that cases of cerebral apoplexy on our medical wards which have a fatal terminal hæmorrhage have a rather rapid rise of temperature in the 36 to 48 hours before death, up to a height of about 103 to 104°. The location of the heat-controlling centre is not definitely settled, but we do know it to be in the neighbourhood of the corpus striatum or other basal nuclei. Therefore any disturbance in this area is bound to have its effect on this very sensitive centre. It is reasonable, therefore, to assume that this irritating blood and the increase in pressure are the disturbing factors which produce the rise in temperature. We have been trying to relate this clinical fact of a rise in temperature in terminal cerebral apoplexy to cases of traumatic cerebral hæmorrhage and to use the temperature curve as a very early indication of the progress of acute hæmorrhage within the skull.

Œdema is the flooding of the brain tissues with the transudates and exudates resulting from the hyper-congestion of the vessels at the site of an injury or along the line of the transmitted force. This fluid knows no boundaries and can therefore spread widely through the brain substance to a degree commensurate with the amount of damage done. The effect of this œdematous fluid will therefore be widespread. It can be understood that in a heightening blood pressure this œdema will tend to increase. On the other hand, if the pressure is relieved then the pressure in the veins and the cerebrospinal circulation will become lower than that of the brain substance, the flow of this œdematous fluid will be reversed, and it will therefore be excreted by way of these channels.

We have noted that hæmorrhage can take place very acutely from the arteries and also more slowly from the veins. In acute traumatic hæmorrhage from the arteries œdema will play a small part in compression because there is no time for its development, whereas, in compression caused by hæmorrhage of venous origin œdema will be a much larger factor, because there is time for its development. One can state as a general rule, therefore, that the longer a case takes in developing compression symptoms, the more likely it is that œdema is the main factor.

Blood pressure is known to be controlled by the vasomotor centre situated in the fourth ventricle. It is closely associated with the cardiac and respiratory centres. The respiratory centre receives its stimulus to activity

from the presence of carbon dioxide in the blood. One can understand, therefore, that the failing heart allows this excessive carbon dioxide to accumulate in the blood stream. The respiratory effort is again stimulated (Cheyne-Stokes), the blood is over-oxygenated, and the heart in turn is whipped up in action. This vicious cycle of events occurs over and over again and the blood pressure is raised higher and higher. This blood pressure, therefore, will rise to various heights according to the cardiac reserve. Unless the intracranial pressure is relieved collapse will inevitably come, with failure of the heart and respiration and the drop in blood pressure which precedes death.

SEQUELÆ

A head injury of any kind may leave some effect of either a temporary or permanent nature. These effects naturally fall into two large groups, physical and mental.

Physical sequelæ whose function, for the most part, we understand, are as follows: (*a*) injury to any of the cranial nerves, which will include all the special senses and motor and sensory aphasia; (*b*) various muscular paralyses; (*c*) various sensory paralyses; (*d*) epilepsy of the Jacksonian type. There are some sequelæ of a physical nature which we do not understand, *viz.*, (*a*) true epilepsy; (*b*) glycosuria; (*c*) atrophy of the testes, with loss of sexual power. It has been lately recognized that this sequel occurs in varying degrees in about 25 per cent of cases. It is possible that these last two complications are due to disturbances in the pituitary gland.

Mental sequelæ are quite common. (*a*) Headache, which may be most distressing. This may be continuous or come in attacks following any excitement and it may last for a long time. (*b*) Cephalalgia, a painful condition of the head. It has been noted that a slight blow to the head is enough to give most distressing and exciting symptoms even as long as a year after the accident. Headache and cephalalgia which persist for a long time may be due to the presence of a residual hæmatocele or pneumocele. A good x-ray picture should be taken, and, if positive, a craniotomy should be performed. (*c*) Amnesia. (*d*) Automatic states. (*e*) Traumatic neuroses. (*f*) Any form of insanity, such as mania, paranoia and melancholia. Fortunately this group is exceedingly small and forms only 0.2 per cent of asylum patients. The outlook is bad; most of the patients die. (*g*) A distressing sequel is the the patient of whom it may be said, that he is not the person he was prior to the accident. This is shown by a lower standard of personality, morality, and physical and mental vitality.

Fortunately, head injuries have few sequelæ which are permanent. One is often asked by anxious parents or by the court what the possibilities are for the development of future complications after a case of head injury. Of course injuries to the special senses and motor and sensory disturbances and the effects due to the loss of brain substance will be apparent from the beginning, and it is our experience that these complications tend to improve with time. Compound depressed fractures, with the loss of brain substance from the Rolandic or other superficial brain centres, are bound to leave permanent effects. The loss of brain substance from the so-called silent areas of the brain seldom leaves any noticeable effects. The fear of most people seems to be centred upon the development of epilepsy. One must be guarded in the prognosis, but the consensus, including all cases of head injury, would place the risk of the development of post-traumatic epilepsy at less than 2 per cent. This condition usually begins quite early after the accident, and if it is of the Jacksonian type it should be operated upon as soon as possible. Experience has shown that there is little use in operating upon this type of patient after two years have elapsed, the epileptiform state apparently having been well established by that time.

Some of these sequelæ become of great importance from a medico-legal standpoint.

Post-traumatic amnesia.—The loss of memory which commonly occurs at the time of an accident is of great medico-legal importance. The patient in court is quite unable to give any account whatever of the accident or the events which led up to it. The gap in his memory is well defined, and usually extends from fifteen to thirty minutes before the accident until he becomes conscious after the concussion. This amnesia is absolute, and is generally permanent, just as if that much time in the patient's life had not existed. The interpretation of this loss of memory of events prior to the accident is hard to understand, but we venture to give this theoretical explanation, based upon anatomical and physiological grounds. The cortex of the brain is composed of the superficial grey layer,

in which is situated the vast concentration of nerve cells. These cells have been proved to be the initiators of all nerve impulses of whatsoever kind, including intellectuality and the power of thought. The underlying white matter of the brain is composed, for the most part, of nerve fibres, both axons and dendrites. The function of these fibres is to convey impulses arising in the cortical cells. The seat of intellectuality, and therefore memory, is supposed to be located in the large so-called silent areas of the frontal, parietal and occipital lobes, and all lasting impressions (memory) are stored in the vast network of white fibres situated in these areas.

Habits are formed from frequent repetition of an act. The same nerve fibres will be called into play to do this act. The impulse, therefore, becomes more easily conveyed along the fibre, and gradually the amount of energy necessary in the cortical cells to initiate this impulse becomes less and less. In other words, the oftener a man does a certain act, the less actual use does he make of his cortical cells. With this explanation, one can understand why practically all the ordinary routine actions of life are done automatically and with little actual thought required. Similarly, a motor car driver will drive his car automatically and the only things that he will remember along his trip will be outstanding events. He drives his car automatically by the use of his sub-cortical cells and fibres, and only the outstanding events call into use his cortical cells. In a case of traumatic amnesia, therefore, it is this last outstanding event which our patient remembers and this may have happened some time before his accident.

The question arises then, why does not our patient remember such an outstanding event as an impending motor crash? This can be explained by the fact that it requires time for the transference of any impulse received by our senses to the storehouse of memory. Nerve impulses travel along the nerve fibres at the rate of 120 feet per second, but the biggest delay occurs at the synapses or junctions between the dendrites and the next nerve cell. There may be six or eight sets of fibres and synapses before the storehouse of memory is reached. The delay at the synapses may be as long as one-fifth of a second. This depends upon what is known as reaction time, and this varies with the individual. One can understand, therefore, that before this impending motor crash can make a lasting impression in the brain the accident has occurred and concussion has taken place with its consequent paralysis.

Automatic states.—These immediately follow upon a head injury when the blow to the head has been just severe enough to produce a concussion of very short duration. Consciousness is recovered rapidly but there is such circulatory confusion that the mental state does not return at once to normal. In this condition, the patient is liable to perform various complicated acts which are not under the control of his cortical cells. He may for the time being become a raving maniac or commit murder. The patient may appear natural in everything he is doing but he nevertheless is irresponsible for his acts. These automatic states vary in their duration. In the short case the patient may be dazed and not realize where he is or what he is saying before he comes to, sometimes very rapidly. In a case of longer duration he may carry out complex and apparently voluntary acts for sometime and have no memory afterwards of what he has done. These mild degrees of concussion are commonly seen on the football field, but one doubts whether their true significance and danger are fully realized.

Closely allied to this automatic state is the very irritative modification of consciousness due to venous engorgement at the onset of all large intracranial hæmorrhages. This happens in the case where the blow is of such a nature as to cause very light concussion and an acute traumatic cerebral hæmorrhage. The patient becomes irritable, rapidly excited and violent. He may show little mental confusion and seem fully conscious but is impervious to all argument. This condition is absolutely indistinguishable from alcoholic excitement and the unfortunate victim is likely to be placed in the police cells. The hæmorrhage in these cases is usually large and coma supervenes within an hour or two. There is no way of distinguishing between these two conditions in their irritable phase, and the diagnosis can only be made by keeping the patient under constant observation, when with the onset of coma the diagnosis becomes clear.

Traumatic neurosis.—This is the term applied to a disorder of function of the nervous system in which no organic changes can be recognized. This sequel occurs quite commonly after any injury but in a rather large percentage of head injuries. The patients are usually those who have previously suffered from some impairment

in the functions of the general nervous system. This impairment may have been caused by a prolonged state of physical ill health, and is commonly found in women whose life has been spent in a sedentary, childless, and purposeless manner. These people quickly feel any undue stress and are unable to adjust themselves to the average circumstances of daily life. The neurosis may arise directly from the pain of the injury or from the mental shock produced through the special senses of sight and hearing. Very commonly, however, the patient will recover from the injury only to have the symptoms begin upon return home. To one of this mentality the return to the old environment and the over-sympathy of "kind" friends are no doubt the exciting factors. We have, therefore, first a mental or physical shock followed by the development of an emotional state. This in turn gives rise to (*a*) mental disturbances, and (*b*) physical disturbances.

Mental disturbances. There is a lack of appreciation of the relative importance of the normal happenings of life. Small incidents are magnified, the slightest ache is the starting point of some dreadful disease, and an unimportant lapse of memory is the beginning of some mental disorder. There is an indescribable fear of impending trouble which destroys the patient's peace of mind, and he worries continuously and loses confidence in himself. There is loss of the power of concentration and the fear of making mistakes, and it is conceivable that this state of mind may become worse and pass into melancholia.

Physical disturbances. These commonly take the form of headaches, pains, crawling sensations, indigestion, sinking and fainting feelings, and palpitation, and all are produced by disturbances of the sympathetic nervous system. Other common complaints are tenderness and weakness of the spine, great fatigue upon exertion, when everything seems to be a burden.

On examination no signs of organic disease will be discovered; the reflexes may be normal or exaggerated, but never absent unless other disease be present. The muscles may be weak and lowered in tone but there is no paralysis. Romberg's sign may be simulated but no true muscular incoordination is present. In fact, one could relate the whole category of a thorough examination of the nervous system but no organic abnormality will be found. The presence of any abnormality would suggest the presence of coincident disease.

Needless to say, these patients should be placed under treatment as soon as possible. In any hospital the patient will do well under kind and firm treatment by those who are not relatives or friends. Upon return home the assumption of responsibility and the added worry of an impending lawsuit aggravate the condition. The sooner these sources of worry are removed, the sooner will the patient be on the road to recovery. Mild cases sometimes recover with startling rapidity upon the settlement of litigation. On the other hand, cases of long duration, which have progressed to the melancholic state, may require institutional care.

INDICATIONS FOR CÆSAREAN SECTION*

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IN the history of Cæsarean section a notable difference is to be observed in the risks of the operation before and after the last two decades of the 19th century. Previous to 1880 the mortality of Cæsarean section was appalling; after that date it declined so rapidly that at the beginning of the present century it was little higher than it is today. This tremendous improvement was brought about by the application of Lister's principles of antiseptic surgery and by Max Sanger's insistence on the necessity of suturing the uterus. The increased safety and the comparative simplicity of the classical operation have led to a great extension of Cæsarean section, an extension so great that many authorities consider the pendulum has swung too far, and that the indications for the operation must be more sharply defined.

In 1796 Alexander Hamilton,[1] Professor of Midwifery in Edinburgh University, wrote that in Great Britain the operation had been performed thirteen or fourteen times but had never proved successful in saving the life of the mother. The only indication for Cæsarean sec-

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tion which he would admit, though several others had been brought forward, was so great a contraction of the mother's pelvis that the fetus could not be delivered after embryotomy. At the present day, as an extreme example of the the opposite point of view, one finds Hirsch[2] stating in 1928: "today it is safer for a woman to be delivered by abdominal section than by the vagina". His position finds few supporters; indeed Munro Kerr thinks that Cæsarean section might well be made notifiable. Gainey[3] recently declared that in two hospitals in the Kansas City district the incidence of Cæsarean section was 32 per cent and 14.7 per cent respectively. Stander[4] considers that the Cæsarean rate for any maternity clinic should certainly not range above 4 per cent, and that in private practice it should be much lower, 1 per cent being a high rate for such patients.

In the eight-year period, 1930 to 1937 inclusive, there were in the Winnipeg General Hospital 198 Cæsarean sections in a total of 6,668 deliveries, giving a Cæsarean rate of 2.96 per cent. In the ten-year period, July 1, 1923 to June 30, 1933, on the public maternity wards of the hospital there were 5,339 deliveries with 43 Cæsarean operations, an incidence of 0.8 per cent. It would appear that the obstetricians in the Winnipeg General Hospital are reasonably conservative in their outlook regarding abdominal deliveries.

In a consecutive series of the last 200 Cæsarean sections in the Winnipeg General Hospital performed by various operators the indications were listed as follows:

TABLE I.

Disproportion without previous section	119
Disproportion with previous section	34
Disproportion with previous section and rupture of uterus	1
Placenta prævia	7
Accidental hæmorrhage	2
Chronic nephritis	1
Atresia of vagina	1
Rigid cervix	1
Fibroids of uterus	4
Previous myomectomy	1
Ovarian cyst (dermoid, obstructing)	1
Parovarian cyst	1
Toxæmias of pregnancy	4
Eclampsia	1
Diabetes	1
Mitral stenosis	3
Cardiac decompensation with disproportion	1
Recent fracture of pelvis	1
Vesico-vaginal fistula	1
Carcinoma of cervix	1
Rupture of uterus	1
Fracture of hip	1
Pelvic floor previously repaired	1
Hemiplegia, previous section	1
Congenital dislocation of the hip	2
Deformity of the spine	1
Contraction ring with disproportion	1
Breech presentation	4
Tuberculosis, pulmonary	2
Tuberculosis of kidney with toxæmia	1
Not stated	8

Parity is recorded as follows:

TABLE II.

Para-I	79
" II	62
" III	28
" IV	8
" V	5
" VI	1
" VII	2
" VIII	1
" IX	1
" XI	1
" XII	1
Not stated	11

The ages of the patients ranged from 21 to 44 years and in a number of instances age was an admitted factor in reaching a decision to operate.

The type of operation performed is set down as follows:

TABLE III.

Classical	96
Classical with resection of tubes	64
Classical with myomectomy	2
Low section	9
Low section with resection of tubes	5
Hysterectomy	3
Not stated	21
	200

Some type of operation to effect sterilization of the patient was done in 72 cases or 36 per cent. Thirty-three patients had two sections performed and 24 of these were sterilized, and 2 had three sections and were sterilized.

Reference to Table I shows that disproportion between the mother's pelvis and the fetal head was listed either as the sole or the principal indication for the operation in 154 instances. "Disproportion" is a blessed word and doubtless in this series it covered a wide range. Only in a few cases were pelvic measurements recorded, but in 9 instances it was stated that one or more children had been stillborn in previous vaginal deliveries. Two pelves were set down as flat, 5 as generally contracted, 2 of the male or funnel type; in two instances there had been congenital dislocation of the hip, and in another, old tuberculous disease of the spine for which an Albee bone grafting had been done. Four patients presented the dystrophia dystocia syndrome, their height being respectively 4 feet 6½ inches, 4 feet 7½ inches, 4 feet 10½ inches, and 5 feet 1 inch. The latter patient weighed 143 pounds.

According to Newell[5] the absolute pelvic indication for Cæsarean section is a true conjugate diameter of 2 inches (5 cm.) or less. This was the only indication recognized by Hamilton in 1796. A relative indication, Newell says, is found when the true conjugate diameter is between 2 and 3 inches (5 to 7.5 cm.), but the excellent results of Cæsarean section under modern conditions have led to still greater diameters, 3 to 3½ inches (7.5 to 8.7 cm.) in flat, and 3 to 3¾ inches (7.5 to 9.3 cm.) in generally contracted pelves, being recognized as an indication for the operation after a trial of labour has shown that delivery by the vaginal route is too hazardous for the child. Munro Kerr[6] is somewhat less exacting. He thinks that with a true conjugate of 3½ inches (8.7 cm.) and the child mature a trial labour should be permitted only under special circumstances, these being a small child and a good position. He divides pelvic disproportion into three degrees, major, minor and medium: minor in which the conjugate vera is below normal but not less than 3¾ inches (9.3 cm.); major in which the conjugate vera is under 3¼ inches (8.1 cm.); and medium in which the conjugate vera is 3¾ to 3¼ inches (9.3 to 8.1 cm.).

Previous Cæsarean section was listed as an indication in 39 cases. Of these, three women had had previous sections because of placenta prævia, with no mention of disproportion, and in the following labour placenta prævia was not present but the operators evidently held to the dictum of Williams: "Once a Cæsarean always a Cæsarean". While it is true that a previous section adds to the risk owing to the possibility of rupture of the uterine scar in a subsequent labour, yet if the previous indication for operation is not present in the second instance, if convalescence after section had been smooth, and if the patient can be kept under close observation in the last weeks of pregnancy, a test of labour may be allowed in a hospital. Many patients dread repetition of the operation and will endure another pregnancy much more cheerfully if it is understood that they will be permitted to have a test of labour. In a majority of such cases delivery can be successfully effected *per vaginam* but if signs of rupture develop operation can be performed at once. Stander[7] says that at present there is far too great a tendency to attempt to justify the performance of a Cæsarean operation on the ground that the patient has had a previous operative delivery.

In certain types of placenta prævia Cæsarean section is being recognized as the truly conservative method of treatment. Lawson Tait[8] first proposed its use in this connection in 1899. Munro Kerr[9] states that for central and marginal types Cæsarean section makes a strong appeal and that he has come to extend its scope more and more every year. Provided that the patient is in a hospital, that she has not already been infected, and either that a blood transfusion has been given immediately before operation or that suitable donors are at hand for a transfusion later, Cæsarean section for the central and marginal types is life-saving for the mother and the child. The latter has four times the chance of life after abdominal than after vaginal delivery.

Accidental hæmorrhage was the indication in two cases, with both mothers and one child surviving. In general, however, the method of Gordon Ley[10] which consists in rest, rupture of the membranes, administration of morphine to lessen shock, and later of pitocin to bring on or increase labour pains, gives better results in accidental hæmorrhage than does Cæsarean section. In utero-placental apoplexy hysterectomy without opening the uterus is the method of choice as the child is invariably lost and the danger of post-partum hæmorrhage is great if the uterus is retained.

In this series operation was resorted to in four cases of toxæmia of pregnancy and in one case of eclampsia. In recent years section has been advocated in those cases of severe pre-eclampsia which have not responded to medical treatment and for which it is considered that induction of labour would be too slow. The results of Cæsarean section for eclampsia in general are so bad that operation should be considered only in fulminating cases, particularly when labour has not set in or the cervix is dilating very slowly.

Section was performed in four cases because of uterine fibroids, and in one case each for previous myomectomy where the tumours had extended to the endometrium, for dermoid ovarian cyst with disproportion, and for a par-ovarian cyst. Many authorities have pointed out how seldom is operative interference necessary in cases of fibromyomata of the uterus, but in some instances Cæsarean section, either with myomectomy or with hysterectomy, may be necessary. In one case in this series a primi-

gravida of 40 had obstruction at the outlet from fibroids and the uterus had almost ruptured.

Cardiac disease was the indication in four cases, three with mitral stenosis, in one of which there was associated auricular fibrillation, and one case with decompensation and disproportion. All four were sterilized. Patients with cardiac disease should be closely supervised throughout the whole of pregnancy, and rest, especially after the sixth month, should be insisted upon. It is advisable that there be the closest cooperation between the obstetrician and the cardiologist. When it appears that labour will be long and difficult, or when sterilization is deemed necessary, Cæsarean section may be resorted to in patients with severe cardiac lesions.

Diabetes was the indication in a single case. The introduction of insulin has greatly improved the outlook for pregnant diabetics, but where there has been a history of habitual death of the fetus, or when the viable fetus seems to be unduly large, operative intervention may save the child.

There was a single instance each in Table I of atresia of the vagina, rigid cervix, and a previous successful repair of a vesico-vaginal fistula. *Per se*, neither of the first two seems a sufficient indication for abdominal operation, but the first was found in a primigravida of forty years, and the second also in a primigravida. Pronounced vaginal cicatrization or a previous extensive repair of the cervix, vagina and perineum might well constitute sufficient indication. Rupture of the uterus is an indication in some instances. One such case was recorded in the series.

Breech presentation was recorded in four cases as follows: (1) small pelvis, frank breech, primigravida of 34 married 8 years and anxious for a child; (2) disproportion, frank breech in a primigravida; (3) disproportion and frank breech in a tertigravida of 38 with previous section; (4) disproportion and frank breech in a primigravida of 32. Munro Kerr[11] reports the employment of Cæsarean section in about 2 per cent of breech presentations. In such cases he favours permitting labour to run its course for a little time and then employing the lower segment operation. Beck[12] and Bourne[13] admit breech presentation in an elderly primigravida as an indication for Cæsarean section because of the great risk to the child in vaginal delivery.

Contraction ring associated with disproportion was recorded once. Hysterectomy was performed as the uterus was presumably infected and because four previous labours had been very difficult.

Tuberculosis figured three times but never as the sole indication. Two cases of pulmonary tuberculosis were associated with disproportion, and in the third, who showed signs of toxæmia, one tuberculous kidney had been removed some years previously, leaving a permanently contracted bladder with a capacity of only two ounces.

Carcinoma of the cervix was discovered in one instance, a para-XI of 41 years. Classical section was done and a 9½ pound living baby delivered. Later, the cervix was treated with radium.

Does advanced age in a woman pregnant for the first time constitute an indication for Cæsarean section? A distinction should be made between women who marry late in life and become pregnant within a few months after marriage and women who have been married for years before becoming pregnant. Those in the former group should be treated much as one would treat younger primigravidæ, though operation may be resorted to somewhat earlier in borderline cases of disproportion. The second group demands more consideration. Uterine hypoplasia is not uncommon in these women. Each case should be studied thoroughly, and if conditions are found which would render vaginal delivery exhausting to the mother and hazardous for the child, Cæsarean section should be done at the time of election or after a brief course of labour. Bourne[14] considers that as a general rule labour is distinctly slower and more difficult between thirty-five and forty.

In this series of 200 Cæsarean sections there were six maternal deaths, a mortality rate of 3 per cent. One case is worthy of note. In a primigravida of 38 with disproportion, high forceps failed and classical section was done, but the mother died six days later. In general it may be said that "failed forceps" is a contra-indication to Cæsarean section, particularly if there is evidence of infection.

There remain as possible indications for Cæsarean section factors which are hard to assess correctly, such as poor physical and poor mental equipment. Malnutrition, lack of rest, exhaustion from a previous labour or from repeated childbearing, anæmia, and an inherited poor physique may render a woman with a minor pelvic deformity or even the disproportion

caused by a large fetus unable to deliver herself safely through the vagina. One patient in this series was a para-VIII of 44 years with disproportion on account of a baby weighing 9 pounds 1 ounce. Women of this type are not infrequently met with in the public maternity wards of hospitals. For them Cæsarean section at the time of election or after a short trial of labour may be an act of true human kindness. Closely related to these patients, as Newell[15] points out, and yet generally in a higher social class are the patients who are nervously unstable and do not bear pain well. These are the women who demand twilight sleep and short painless labour. Unless they are particularly well equipped physically for easy labour, and such is seldom the case, uterine inertia develops early in labour; the patient demands relief and the subsequent course of labour becomes a nightmare for all concerned. Such women, however, stand operation well and recover more quickly than after vaginal delivery.

The type of operation has some bearing. Table II shows that the lower uterine segment operation was performed only in 14 cases out of 179. The New York Academy of Medicine Committee on Public Health Relations considered that the use of the classical type of Cæsarean section should be limited to operations at the time of election.[16] In my opinion the low type of operation is preferable to the classical in all instances except when speed is essential and the patient not infected. It is safer in presumably infected cases, adhesions are less likely to form, and the scar is less liable to rupture. There is therefore with the low operation less need to sterilize a patient after her first Cæsarean operation.

Only in a small proportion of cases is there an absolute indication for Cæsarean section. For the remainder the indications are only relative and the safety of the mother must be the prime consideration. Bourne[17] points out that the mortality risk of Cæsarean section, even in deliberate cases, is four times that of labour, while for some of the obstetrical emergencies the mortality may rise to over 20 per cent. In the Winnipeg General Hospital series the maternal mortality rate from Cæsarean section was six times that of the general rate of maternal mortality, 30 per 1,000 as opposed to 5 per 1,000. When performed at the proper time and for proper reasons Cæsarean section is such an admirable operation that it is a pity to employ it in unsuitable cases. It should not be used as a last resort or as a way of escape for incompetent obstetricians. It is advisable that the operator should be an obstetrician skilled in vaginal delivery, since only one obstetrically well trained can properly assess the relative difficulties and risks of vaginal and abdominal delivery in a particular case. In general it may be said that the more highly trained and adept the obstetrician, the more jealous will he be of the indications for the Cæsarean sections he undertakes but the lower will be his mortality and morbidity rate in such operations. Too often in difficult obstetrical emergencies one is reminded of the famous aphorism of Hippocrates: "Art is long, time is short, the occasion perilous, opportunity transient, judgment difficult and experience fallacious", but the better the obstetrical training and the stricter the obstetrical conscience, the fewer will be the errors of execution or of reasoning.

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TICK PARALYSIS IN BRITISH COLUMBIA

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THE death at Rossland of a three-year old girl, on May 1, 1938, from tick paralysis has again focussed attention on this obscure disease. The literature on tick paralysis is scanty. McCornack[6] reported on 8 cases that he had seen and 6 more described to him by physicians, all occurring in Washington, Idaho or Montana. In his bibliography he quotes the important papers of Todd from 1912 to 1919, dealing with 9 cases of tick paralysis in British Columbia. Since 1921 only a few short papers on this subject have appeared, including those of Bruce,[1] Moilliet,[5] and Gregson[4] in Canada; Parker[9] in the United States; Brumpt[2] in France, and Oswald and Mlinac[7, 8] in Yugoslavia. This disease is also being studied in Australia and South Africa, but we have no publications from these workers.

THE TICK

The tick implicated in the transmission of tick paralysis in North America is *Dermacentor andersoni* Stiles, and is variously known as the wood tick, sage tick or paralysis tick in different sections of the country. It is probably the most important of the North American ticks, as it is also responsible for transmitting Rocky Mountain spotted fever and tularæmia. In Canada it is abundant in the dry belt areas of British Columbia and southern Alberta, and extends into southwestern Saskatchewan. It is apparently absent from the wet coastal belt, except when occasionally introduced on imported animals, and does not occur at all in eastern Canada. Its life-history and habits are well described by Cooley,[3] but may be briefly summarized as follows.

This tick appears as an adult early in the spring and attaches itself to the skin of large wild and domestic animals and man. The sexes mate when on the host animal, and the female, after feeding for about seven days (sometimes more or less), and having increased many times in weight, drops on to the ground and lays about 4,000 eggs. After about thirty-six days the eggs hatch into minute six-legged larvæ, or "seed" ticks.

The small larval ticks crawl up on to grass or other low vegetation, and when the opportunity offers brush off on to small animals, such as rabbits, squirrels, chipmunks, ground squirrels, field mice and other rodents. They remain on the host for about four days, during which time they engorge, then drop off to the ground, moult, and after about thirty-eight days emerge as eight-legged middle-sized ticks, or nymphs, which are still sexually immature.

The nymphs attach themselves to the same kinds of small animals that the larval ticks feed on. After about seven days they drop to the ground, moult, and in about ninety days emerge as adult ticks. The whole cycle may occupy two years or even more.

TICK PARALYSIS

Whilst not a year passes without reports of animals in British Columbia, mostly sheep, but sometimes cattle, being afflicted with tick paralysis, human cases are less common. Nevertheless, such cases are sufficiently numerous to arouse grave concern, and many medical men in the interior of British Columbia are only too familiar with them. The majority of cases have occurred in children, but quite often older people are affected.

The symptoms vary slightly in individual cases, but can be stated to be generally as follows. The patient, perfectly well one day, may on the next complain of a numbness in the feet and legs and have difficulty in walking; a little later it may be impossible to stand up. The hands and arms are usually affected next. Often there is a partial paralysis of the throat muscles, there being difficulty in swallowing; the tongue, too, may be affected, interfering with articulation. Other constitutional symptoms are slight; there may be some restlessness in the early stages, or the patient may complain of feeling a bit seedy. There is no pain, and usually no fever, but the pulse is faster. Generally, it may be said that the paralysis is confined to the motor nerves, and does not affect the special senses.

The time from the beginning of the symptoms to complete paralysis and even death may be less than two days, but is usually from three to five days. The chances of recovery are good

TABLE I.

TICK PARALYSIS CASES—HUMAN

Case No.	*Place*	*Year*	*Sex*	*Age*	*Site of attachment of tick*	*History*	*Results*
1	Kamloops	1910	F	3½	Near spine below nape of neck.	Hands and arms weak. Feet and legs both markedly involved. Inability to stand. Temperature 104. Pulse 150.	General improvement day after tick removed. Temperature down. Discharged from hospital fifth day.
2	Kamloops	1910	M	5	Just beneath occiput, close to midline.	Loss of muscular control of legs. Temperature 99.4. Pulse normal, no pain. Twitching of arms. Showed definite symptoms of paralysis.	Condition completely cleared up in 24 hours.
3	Coldstream	1912	..	4	Between vertebræ of dorsal region.	Inability to stand. Complete paralysis of both lower extremities.	Complete recovery within three days after removal of tick.
4	Vernon	1912	M	40	Back.	Weakness in lower extremities. In perfect health otherwise.	Complete recovery within few days after removal of tick.
5	Kamloops 20 miles out.	1913	F	2	Back.	Lost ability to hold things. Unsteady on feet. Eyes rolling. No muscular coordination.	Recovery following removal of tick.
6	Lytton	1913	M	43	Mid-scapular region.	Legs refused support. Then hands affected. Difficulty in swallowing and in phonation. Clear mentally. No visible eye symptoms. Temperature 101. Pulse 100. Respiration nearly normal but shallow, and distinct signs of cyanosis. Tongue affected. External respiratory muscles not functioning. Knee jerks absent.	In 12 hours after removal of tick returning power to limbs. In 48 hours full control.
7	Princeton	1915	F	11	Crown of head.	Gradually increasing paralysis until all muscles involved. Pupils dilated and ceased to react. Twitching of muscles for four days. Incontinence of urine and fæces. Difficult to breath. Complained of lump in throat. Speech affected. Tongue swollen. Heart rapid above 120 per minute. Temperature subnormal. Sensory nerves normal. Urine negative.	Complete recovery three days after removal of tick.
8	Kamloops 38 miles north.	1915	F	10	Scalp, near midline about 2 inches above occiput.	Stumbling gait. Progressively rising paralysis. Speech and swallowing affected. Cyanosis, slight ptosis of both eyes, and no control of external recti muscles of the eye. Lost control of bladder and marked retention. Temperature 101. Pulse 120 weak. Becoming asphyxiated.	Slow response following removal of tick. After liberal doses of strychnine with free purgation in 48 hours showed signs of improvement. It was 56 hours before she could speak audibly or swallow fluids comfortably, but recovery was continuous and she was well in a week. During sleep breathing markedly stertorous.
9	Kamloops	1916	F	10	Left occipital region.	(1) Motor paralysis proceeding in order of time; (*a*) leg, (*b*) arm, (*c*) palate, (*d*) tongue, showing a progression from below, upward, suggestive of following some lymphatic circulation. (2) Some anæsthesia over inner side of thighs. (3) A fine dermatitis on the chest wall. (4) Profound restlessness.	Paralysis started to clear up within 12 hours after removal of tick. Completely recovered in a few days.
10	Cranbrook	1917	F	4	Side of head; fully engorged tick not discovered until just before dissolution.	Ascending paralysis. Totally paralyzed in day or two.	Death.
11	Alexandria	1918	..	...	.....	Headache. Partial paralysis of legs.	Complete recovery after removal.

TABLE I.—*Continued*

Case No.	*Place*	*Year*	*Sex*	*Age*	*Site of attachment of tick*	*History*	*Results*
12	Clinton	1918	M	5	Right axilla.	Lost use of legs, then arms. Very feverish. Unable to leave his bed.	Died. Tick found after death. Ill three days.
13	Barkerville	1923	..	...	.....	Headache. Partial paralysis of legs.	Complete recovery after removal.
14	Naramata	1928	F	Adult	Vulva.	Complete paralysis. Suspected sleeping sickness.	Slow but eventual complete recovery.
15	Salmo	1930	M	6	Base of skull.	Completely paralyzed in lower quarters. Partial paralysis in arms. Invading tongue. Poor articulation. No fever.	Markedly improved in four days but not able to walk until seventh day.
16	Creston	1930	F	3½	Side of head.	Child felt unwell in evening and fell off a bench. Next morning very ill and unable to stand. Died at noon, a few hours before arrival of doctor.	Examination for possible skull fracture disclosed fully gravid tick at side of head.
17	Ashcroft	1930	F	6	Skin fold of umbilicus.	Drowsiness and staggering gait.	Complete recovery after removal of tick.
18	Ashcroft	1930	M	50	Two ticks attached to arm over left deltoid.	Weakness of limbs, staggered like a drunken man, falling at times.	Recovery.
19	Williams Lake	1930	M	2½	Middle of outer aspect of right arm.	Weak. No paralysis. No temperature. Chest clear. Heart normal.	Complete recovery four days after removal of tick.
20	Trail	1934	M	5	Scalp.	Staggering gait. Unable to stand.	Recovery complete within two days after removal.
21	Kamloops-Louis Creek	1935	F	3	Back of neck an inch above hairline.	Lower limbs paralyzed.	Recovery.
22	Rossland	1938	F	2½	Occipital protuberance of head.	Legs tired. No temperature. Arms later affected. Knee jerks absent. Temperature 100. Respirations largely abdominal and slow and shallow. Cell count 290. Pandy negative. Paralysis of muscles of respiratory region.	Death on third day.
23	Lytton	1938	M	70	Two ticks, one in each groin.	Man staggered in his gait. Thought to be a drunk and arrested. Next day couldn't stand. Patient removed ticks before physician saw him. Hospitalized.	Complete recovery in 30 hours after removal of ticks.
24	Kamloops	....	F	76	Skin near umbilicus.	Dizziness. Weak in limbs. Temperature 101. Pulse 100. Face flushed. Tongue dry. Coarse tremor of hands. Reflexes all present.	Uninterrupted and rapid recovery.
25	Kamloops 38 miles east	....	M	Young man	Tip of spine seventh cervical.	Paralysis confined to legs. Tick only slightly engorged.	Recovery complete in 24 hours.
26	Lower Cariboo	....	..	Child	Back of head.	Respiratory failure.	Death.
27	Heffley	....	M	Adult	Anterior abdominal wall.	To bed—quite well. Rose with partially paralyzed legs, numbness in upper lip. Knee jerks absent. Ankle jerks present. Plantar reflex; plantar flexion. Abdominal reflexes present and equal. Arm reflexes normal and all present. Sensitiveness to pin prick unimpaired in any part of the body. Marked incoordination of arms and legs. Gait markedly ataxic. Romberg positive. Could not walk at all. Bladder and bowel sphincters all right. Swallowing normal. Speech, hearing and sight unaltered.	Recovery.

if the organs of respiration or the heart are not affected.

In the files of the Dominion Entomological Branch laboratory at Kamloops, B.C., are records of 150 cases of human tick paralysis some of which terminated fatally. Twenty-eight of these cases are briefly summarized in Table I. The histories of the cases are, in most instances, taken directly from the reports of the attending physician.

A few cases are on record of paralysis ensuing three to five days after removal of the tick. One typical case of this nature was related by a Penticton physician as follows.

> A young girl was sent to Vancouver General Hospital for a mastoid operation. Just before she left Penticton her sister discovered a tick at the back of the head and removed it. The girl at that time had no symptoms of paralysis. A well-known Vancouver surgeon performed a successful mastoid operation, but reported to the girl's physician that following the operation the patient had developed an inexplicable paralysis. The tick attachment of three days previously was recalled, tick paralysis was suggested, and the excision of a small area of skin at the point of the puncture advised, to remove the head of the tick which had possibly been broken off on removal of the tick. This was done and the patient had recovered from the paralysis by the next day.

THEORIES REGARDING CAUSES OF TICK PARALYSIS

As neither virus, toxin nor bacillus, has been demonstrated as the cause of tick paralysis, and as the picture of tick paralysis is so typical, many theories have been suggested as to the causative mechanism. As pointed out by Gregson[4] there appears to be a definite correlation between the speed of engorgement of the tick and the onset of paralysis. The tick normally takes from seven to nine days, or even longer, to fully engorge, but it has been observed that in practically every case of paralysis on which accurate observations have been made, engorgement was completed in six days or less. One theory put forward was that the fast-engorging tick poured large quantities of the paralyzing medium into the blood stream and paralysis followed. This theory does not appear tenable, as often a sheep has been found harbouring as many as fifty engorging ticks and was not paralyzed, whereas another animal may be paralyzed after the feeding of only one tick. Surely the fifty slow-feeders would in the aggregate inject as much of the paralyzing medium as the single, rapidly engorging, tick. The theory of individual immunity on the part of certain sheep probably does not hold good, as lambs not previously exposed have been infested with as many as twelve fast-engorging ticks without ill effect.

It is not meant to be inferred that because a tick engorges rapidly that paralysis necessarily follows, or that the rapid feeding is the cause of the paralysis. But it would seem logical to conclude that the tick causing paralysis had a pathological condition that induced rapid feeding and this rapid feeding was a symptom of such condition. The fact remains that because of this habit paralysis is induced very speedily in the affected cases, and immediate steps must be taken if they are not to terminate fatally.

The point of attachment of the tick apparently has no bearing on the subsequent paralysis, as the cases quoted show. The rapid recovery exhibited when the causative tick is removed has often given rise to the opinion that the paralysis-producing tick has been feeding over a nerve centre. Supporters of this theory, however, merely base their conclusions on the fact that ticks are usually seen along the neck or head. Ticks being negatively geotropic naturally tend to climb upwards and are therefore frequently found on the head of man and animals, but if they attach before reaching this point paralysis may follow. A dog has been observed by the junior author with an engorging tick on the tip of the ear and the animal was completely paralyzed. In any case, the hypostome of the tick rarely penetrates the epidermis to a depth of more than a millimetre or two.

While tick paralysis in human beings is usually reported in children or younger persons, age does not appear to be a factor, as several cases have occurred in mature adults. Undoubtedly, as mentioned by McCornack,[6] adults find the ticks easily and remove them, which probably accounts for the lower adult morbidity.

While in most cases of tick paralysis recovery is complete there is at least one case of a lasting residual effect. A young woman, now resident in southern British Columbia, was the victim of tick paralysis as a child, about fifteen years ago. The facial muscles were affected and also the arms, and this state persists even today, the subject still not having full control of her hands, and her mouth being askew. This case, however, is probably atypical, and might suggest infantile paralysis, although there is a definite history of the removal of an engorged tick.

So far the work on tick paralysis conducted by the Division of Entomology at Kamloops, B.C., has been largely devoted towards a study of the cause of the disease. The investigations have involved close contacts with workers in

other countries where tick paralysis has been known to occur. Although *Dermacentor andersoni* is the only tick as yet associated with the disease in North America, at least eight other species of ticks are involved in paralysis diseases in other parts of the world. It is important to bear this fact in mind, for while these diseases are caused primarily by ticks, such a wide distribution and variety of vectors might easily, and probably do, produce different types of paralysis. Such indeed would appear to be the case when one considers the opposing views held by workers in Australia and Yugoslavia. In view of these facts, the British Columbia problem may involve paralysis of a unique type.

In the case of the local paralysis the disease, as before stated, may be produced in an animal by a single tick. The symptoms appear only when the tick has been engorging for from four to five days and is nearing repletion. Inasmuch as only fast-feeding ticks appear to be involved, the tick usually drops off within a day or two of the onset of paralysis. The engorged tick may drop from the patient before or after death occurs.

The rapid recovery that usually follows early removal of the offending tick suggests mainly a very labile toxin as being the factor involved in the paralysis. This theory is further strengthened by negative necropsy findings, and negative inoculation tests with the blood from paralyzed animals and suspensions of the ground-up ticks responsible for the condition. In keeping with this theory is the fact that in Australia experiments have been conducted in which it was found that an injection of crushed salivary glands from two and a half ticks proved to be the minimum lethal dose for mice. This experiment, however, has not been duplicated in British Columbia, extracts from glands from as many as seven ticks, dissected *in vivo* or while frozen, and injected intravenously, subcutaneously, and intraspinally into mice, dogs and sheep, having proved without effect.

Opposing the theory that a salivary toxin is involved are the results of Oswald and Mlinac of Yugoslavia. These workers have been able to produce paralysis in guinea pigs and rabbits by injecting into them an emulsion of ground tick eggs. They accept a thermolabile toxin in the egg as being responsible for the disease, viruses and bacteria being ruled out by negative inoculations from dead animals to media and healthy stock. Similar experiments at the Kamloops laboratory suggest that the eggs of the local paralysis-producing ticks may also be fatal for experimental animals.

From histological studies of host tissues at the points of attachment of fast and slow-feeding ticks it would appear that the fast-feeding ones have a greater power to produce disturbances within the tissue sufficient to cause a liberation of blood from the vessels. That is, the feeding rate is dependent on some quality in the tick, rather than on an abundant blood site on the host. Thus, the cause of paralysis probably involves some physiological difference within certain individual ticks. Whether this difference is produced by external factors (climatic or some host-tick interaction) or is hereditary, remains to be seen. The fact that paralysis-producing ticks appear morphologically and histologically the same as any harmless tick makes the problem all the more difficult.

PERSISTENT ULCERS FOLLOWING TICK BITE

In some cases not involving paralysis a severe local reaction occurs, resulting in one or two conditions. In the first type a slow-healing ulcer results. In the second there is apparent healing of the ulcer, but the irritation reappears after several months. The first type is illustrated by the following case.

A female, aged 9, June, 1915. The tick was found on the mastoid bone. Her father removed it by force. Next morning the child complained of itching and a red spot appeared. In two days the parts were much swollen and tender, with a raised spot where the head of the tick was embedded. Hot poultices were applied for four days and the part incised. The skin was very tough and very little pus escaped. The next day pus came from the ear as well as from the incision. On the third day after the incision was made, a dark, rubbery mass came away, leaving a "punched out" ulcer. The ulcer had not healed by August 15, 1915. The pruritus was so severe that the child's hands had to be tied at night.

To illustrate the second type of local reaction, three interesting cases are described as follows.

M.M., male, aged 34. One night in May, 1913, on retiring, he felt an irritation along the right tibia. He rubbed the leg vigorously with the hand. Next morning the pruritus was very marked and a red spot appeared on the leg. The body of the tick was found on the floor. That day the leg began to swell and continued to do so until it was nearly twice its normal size. An abscess developed at the point where the tick's head was embedded. Hot poultices were applied for a week, then an incision made. The skin over the abscess was very tough. A creamy-looking pus escaped. In about three days a hard dark-coloured mass came away. This was almost of a rubbery nature, and left an ulcer which extended nearly to the bone. I treated this as an ordinary ulcer for a week, but it showed no signs of healing. By that time the ulcer had hard indurated edges, giving it a "punched out" appearance. There

was a thin watery exudate coming from it. The only thing the patient complained about was the intense itching. In two months the ulcer was covered with skin. Each spring an ulcer has formed on the same place, which takes two weeks to two months to heal. The leg itches almost constantly, at times becoming almost unbearable. (This was written three or four years after the case was first seen).

The second and third cases involved a father and son who were bitten by ticks in April, 1936, between Creston and Cranbrook, B.C. Each had several bites, but only one in each case that caused subsequent trouble.

The boy, aged 19, was bitten on the right side of the scrotum. Until November the bite was red, with a slight serous discharge, neither increasing nor decreasing, and causing no serious trouble. On November 23rd, seven months after the bite, a tremendous swelling of the right inguinal gland occurred. Two ounces of pus were removed on December 8th, and the glands healed, but the original bite on the scrotum was still indurated, and discharging clear serum. It was then cauterized, and has since caused no further trouble.

The father was bitten on the left shoulder blade. As in the case of the son, the bite was red and discharging slightly, but caused no particular trouble until December 4th. On that date his temperature had risen to 105° F., his pulse 160, and the left axillary gland had become tremendously enlarged. The doctor opened it on December 4th and found that the swelling had extended into the subpectoral glands. On December 6th, it was opened almost to the nipple area. On December 8th the temperature was down to normal, and the axillary gland had stopped draining, but the original bite was still red and indurated and discharging clear serum. On December 8th it was cauterized to a depth of a half or about one inch area. The patient convalesced slowly; he had no further trouble, but did not feel really well again until mid-January.

The particular interest in these two cases is the fact that glandular involvement occurred about seven months after the tick bite.

Similar delayed reactions have been observed from bites by the coast tick, *Ixodes ricinus*, Linn. in our own laboratory workers.

POPULAR FALLACIES CONCERNING TICKS

Many incorrect theories concerning ticks have gained such credence that it is felt they should be mentioned here. One of these is that ticks drop or jump from trees on to their victims. This is not the case. The favourite haunt of adult ticks in the active season is on clumps of grass, sagebrush, or similar low vegetation where, having no jumping muscles, they are forced to wait until a host passes by and brushes them off the bush.

A second belief which is very popular is that ticks bore into the skin until they reach the spine. Ticks possess no boring mouth-parts; what actually happens is that the irritation set up by the sucking of blood inflames the flesh to a certain extent and it swells up around the tick, giving the impression of its "boring" in.

A third fallacy, perhaps suggested by the previous belief, is that ticks must be "unscrewed" when removing them. This is a dangerous practice, since if the tick is firmly attached the unscrewing process is apt to break off the head and leave it in the flesh, where it may cause an annoying sore.

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THE ALCOHOL TEST OF HEPATIC FUNCTION.—E. Serianni and G. Lolli report from the University Institute for Human Physiology in Rome their experiences with a new test of hepatic function. It depends on the fact that, while in health the curve representing the concentration of alcohol in the blood varies greatly according to whether the alcohol is taken on a fasting or a full stomach, in certain diseases of the liver this curve is the same whether the alcohol be taken on a full or fasting stomach. The liver conditions which give rise to this abnormal reaction are Laënnec's cirrhosis, new growths of the pancreas, compression of the biliary passages with jaundice, and certain forms of cholecystitis with or without gall-stones. The test consists in giving by the mouth 0.5 c.c. of alcohol for every kilogram of body weight in a 20 per cent watery solution. The blood is tested for alcohol five minutes later, the test being repeated every ten minutes during the first hour, and every fifteen minutes during the second and third hours. A day or two after these tests have been carried out in the fasting state the same procedure is followed an hour or two after an ordinary mixed meal has been taken. In health the blood-alcohol curve will be higher and longer after alcohol has been taken in the fasting state than after a full meal, whereas in the presence of the above-mentioned diseases of the liver the behaviour of both the full and the fasting curves will be identical. —*Dtsch. med. Wschr.*, February 18, 1938, p. 258. Abs. in *Brit. M. J.*

ANÆSTHETIC COMPLICATIONS FROM REFLEXES EXCITED DURING ABDOMINAL SURGERY*

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THE anæsthetic control of the abdomen is the legitimate ambition of every anæsthetist who assists the surgeon during manipulations within the abdominal cavity. Too frequently the hope is not completely realized, despite the certainty that an accepted technique has been employed without error. The improvements in modern inhalation anæsthesia and the introduction of new agents have not served to eliminate the occasions when the anæsthetist is embarrassed and the surgeon handicapped because the anæsthesia fails to afford control of the abdomen throughout a surgical procedure. During earlier surgical eras the operator placed more reliance upon dexterity and speed for the completion of his manipulations, and anæsthesia that gave relief of pain with moderate relaxation was accepted. Today the surgeon not only attempts more intricate exercises but has become more deliberate. He will accept no anæsthetic as satisfactory that does not present him with a perfectly convenient operating area regardless of the time consumed or the extent of his activity. Not rarely he may demand the convenience of spinal anæsthesia to obviate some of the possible handicaps during exploration, often with too little regard for the individual requirements of the patient. It is well recognized that the best results for the patients are obtained by utilizing all the available accepted methods and drugs rather than by following any routine procedure. The anæsthesia that best serves the individual should be chosen after considering his physical and psychical condition. The anæsthetist must accept the definite obligation to determine the cause of untoward reactions which may interfere with the progress of the operation. He must develop means for their prophylaxis and treatment if he chooses to individualize his methods for the patient's safety rather than for the surgeon's convenience.

During abdominal surgery disturbing reactions which are associated with trauma or traction may occur. These reactions are commonly referred to as "traction reflexes". They are manifested by hæmodynamic, myotonic, or respiratory effects. The complications may consist of contraction of the abdominal muscles with expulsion of the intestines through the incision or into the operative area. There may be retraction of the cut edges of the peritoneum. Changes in pulse rate or rhythm and in blood pressure levels may occur. Respiratory rate and volume exchange may be altered, or adduction of the vocal cords with accompanying respiratory obstruction may be encountered. These effects have long been recognized and are observed more frequently when traction is made upon uterine attachments, the peritoneum, mesenteries, or an upper abdominal viscus. They often follow the sudden removal of large abdominal tumours. They are more common in the presence of peritonitis or inflammation. Although recognized, the exact mechanism for the production of many of them has not been accurately described. Guedel calls attention to a subdiaphragmatic reflex occurring during upper abdominal surgery, causing cord adduction with an expiratory grunt and an inspiratory crow.[1] He finds this reflex most active when peritonitis is present, but anticipates it during any operation in the upper abdomen. The extent of the disturbance is directly proportionate to the suddenness and degree of traction. Brewer and Luckhardt have demonstrated with animal experiments a similar reflex. Direct stimulation of the splanchnic nerves or traction on the mesentery causes vocal cord adduction with laryngospasm or apnœa.[2] Davis *et al.*, found that stretching the biliary or cystic ducts in unanæsthetized dogs was followed by respiratory inhibition.[3] Distension of the stomach has been found to cause reflex changes in blood pressure.[4] A fall in blood pressure regularly accompanies traction on gastric and duodenal mesenteries. Reflex changes in blood pressure have been shown to follow stimulation of the splanchnic

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nerves.[5, 6] Traumatic stimulation at the cœliac plexus has been demonstrated in the laboratory[7] and observed in the clinic[8] to affect blood pressure and muscle tone reflexly. The circulatory disturbance is manifested by a distinct reduction in pulse pressure with little change in pulse rate. It is of special interest that when this blood pressure change was noted there was often accompanying abdominal rigidity and relaxation was difficult to secure and maintain.

It is not the purpose here to discuss the mechanism or possible pathways for the reflexes that may be observed during abdominal surgery. However, it is significant that experimental investigation has established that afferent fibres from the abdomen are contained in many autonomic nerves and that the pathways from abdominal viscera are largely in such nerves. McSwiney *et al.*, have demonstrated in laboratory animals afferent fibres from the gastrointestinal tract in the splanchnic and vagus nerves.[9, 10] The same investigators have shown that these visceral afferent fibres pass not only directly to the medulla but also enter the spinal cord from the sympathetic chain by way of the white rami and dorsal roots. The threshold values for stimulation are low at the duodenum and stomach but increase progressively in the jejunum and ileum. After the lower ileum is reached there is no response.[11]

These described reactions are primarily reflexes elicited by nerve stimulation from trauma or traction. Circulatory effects may also be produced mechanically by traction or manipulations. Luckhardt[12] demonstrated that traction applied upon the diaphragm or upper abdominal viscera may collapse large veins and block venous return to the right heart. A sudden severe fall in blood pressure follows. The sudden removal of large abdominal tumours may likewise be accompanied by a severe fall in blood pressure levels. Such tumours may during their growth compress abdominal veins and necessitate a readjustment of the circulation. When pressure is suddenly removed and normal venous drainage restored, pooling of considerable blood in the large valveless veins is possible and a fall in blood pressure is mechanically produced.

Since the reflexes under discussion are transmitted largely by the autonomic nervous system, with both sympathetic and parasympathetic divisions involved, it is of clinical importance to investigate alterations in the tonic activity of either division during anæsthesia. It introduces speculation regarding the homœostatic reactions of different individuals presented for abdominal surgery. It has been advanced[13] that there may be a constitutional imbalance of the divisions of the autonomic nervous system. Although conclusive evidence is lacking, repeated clinical observations have established a general inference favouring the theory that certain patients respond more actively to adrenergic and others to cholinergic stimuli. Or, what is more often suggested clinically, a vago-sympathetic disequilibrium exists so that the sympathetic and parasympathetic may be hyper- or hypo-active simultaneously. There has been some effort to classify patients in this respect by the disease exhibited. For example, exaggerated parasympathetic activity is usually associated with gastric or duodenal ulcer[14] and with spastic constipation.[15] The vagotonicity of the individual has also been found to be inversely related to the choline-esterase activity, as evidenced by a decreased choline-esterase activity of the serum in patients with jaundice or biliary tract disease.[24] Sympathetic hyperactivity is more often found in patients with hypertension and tachycardia.[16] Attempts to establish a diagnostic procedure for identification of hyperactive vago-sympathetic states have been suggested. They include pharmacological tests and the reaction of different reflexes. Subcutaneous injection of epinephrine, atropine, pilocarpine, ergotamine or inhalations of amyl nitrite are among those advised. However, the various pharmacological tests for investigation of the reactivity of the autonomic nervous system are often unreliable, particularly when a vago-sympathetic disequilibrium exists.[17] Diagnosis by means of reflexes has been suggested by Pascalis[18] who used the oculo-cardiac reflex to determine patients with sympathetic hyperactivity. Garrelon[19] employed the same reflex to identify anæsthetic resistant individuals and included those in whom compression of the eyeballs was accompanied by no change in pulse rate or a tachycardia. In this clinic the abdomino-cardiac or solar plexus reflex has been investigated as a possible aid in determining sympathetic overactivity.[8] The oscillometric method of Laignel-

Lavastine[20] was used. It consists of applying the arm band of an oscillometer to a patient in the supine position and determining the degree of oscillation. Then, with the patient relaxed, pressure is carefully exerted with the finger tips of the extended hand in the region midway between the umbilicus and the right costal margin. The sphygmomanometric pressure should remain constant and when a definite diminution in oscillations occur, sympathetic hyperactivity may be expected. Although the observations are not conclusive it is the impression that the test may be of value, particularly when the cœliac plexus area is extremely sensitive.

During surgical intervention reactions of the autonomic nervous system may be effected from the preanæsthetic medication, from the anæsthetic agent employed, or through direct nervous stimulation. It is established since the classical experimental work of Loewi in 1921 that inhibition and augmentation following stimulation of the parasympathetic and sympathetic fibres is due to liberation of chemical substances. This chemical transmission of impulses is interfered with by atropine and scopolamine, which inhibit the effects of acetylcholine, the chemical produced by stimulation of cholinergic fibres. Eserine augments the parasympathomimetic effects of acetylcholine by inhibiting the enzymic action of cholinesterase. There is evidence that certain barbiturates enhance parasympathetic stimulation.[21]

That anæsthetic agents may cause exaggeration of autonomic nervous system reflexes is not without clinical and laboratory support. Ether and chloroform stimulate the sympathetic according to Knoefel, but ethylene and cyclopropane do not.[22] Guedel stresses the fact that sympathetic hyperactivity is frequently encountered during the early stages of narcosis immediately after consciousness is lost.[23] There are accumulating laboratory evidence and clinical observations, which will be the subject of a later report, to demonstrate that cyclopropane may effect a stimulation of parasympathetic fibres.

In the light of present knowledge it does not appear probable that the anæsthetist can regularly determined by preanæsthetic examination, the reflex effects that may be encountered after manipulations within the abdomen are begun. If such prognosis could be made accurate, prophylaxis for untoward effects could be approached scientifically by the choice of premedication and anæsthetic agent. One may only anticipate effects that follow stimulation of sympathetic fibres when drugs such as ether or chloroform are employed and more particularly, if they are used in atropinized individuals. Effects from parasympathetic fibre stimulation may be expected when cyclopropane is employed. The use of barbiturates in small doses and of adrenalin with cyclopropane would enhance the possibility of such effects, but with atropine they would be decreased.

Although prophylactic measures are difficult for the anæsthetist in so far as the reflex effects upon circulation and muscle tonus are concerned, the situation is more promising with respect to the respiratory reactions. Translaryngeal endotracheal intubation has provided anæsthetists with a convenient technique which eliminates cord adduction and respiratory obstruction from laryngospasm. It has also simplified the regulation of patients with temporary or prolonged apnœa, since controlled respiration is conveniently accomplished with an endotracheal airway in place. The degree of narcosis may also be satisfactorily regulated since there is no barrier to the introduction of an adequate amount of anæsthetic agent. It is a conviction in this clinic that explorations in the upper abdomen during inhalation narcosis should be accomplished with a technique which includes endotracheal intubation.

Any discussion of ways and means to prevent "traction reflexes" must necessarily include the surgeon's rôle. The entire responsibility for untoward reactions produced mechanically belongs to the surgeon. The anæsthetist can do little more than advise with observations upon the status of the circulation. The reflexes that are produced by traction and by trauma will be minimized if the tissues are handled gently and with dexterity; they will be magnified when the viscera are roughly manipulated, when packs are injudiciously or unnecessarily used, when traction is severe or indiscriminate, and when positions such as extreme inversion or with the feet and head both lowered are employed. Unfavourable reflex reactions are more frequently observed when high gall-bladder lifts are utilized than

when the patient is on a level table. Beginning the operative procedure before anæsthesia is properly adjusted invites discouraging results, and persisting while the anæsthetist attempts to make adjustments practically insures unsatisfactory if not dangerous sequelæ.

The actual treatment of the reactions arising from "traction reflexes" deserves the consideration and cooperation of both anæsthetist and surgeon. When muscle rigidity interferes with convenient operating it seems apparent that the degree of narcosis could be increased until the muscles were flaccid. This is not always easy to accomplish. There is a difference in opinion among experienced observers concerning the depth of anæsthesia needed to abolish the reflexes, but there is agreement that it differs widely in individuals. Some patients will require a dangerous overdose of the anæsthetic agent to abolish reflex activity and accomplish adequate relaxation. It does not always follow that ideal operating conditions are assured when large abdominal muscles are relaxed. The intestines may still protrude and the cut edges of the peritoneum refuse to approximate when the recti are flaccid and the intercostal muscles paralyzed. It is not always the part of wisdom to "push the anæsthetic" until convenience for the surgeon is obtained. If the concentration of the anæsthetic agent in the blood necessary to control the abdomen causes circulatory depression the safety of the patient is sacrificed to accommodate the surgeon. If the anæsthetist chooses to increase the depth of anæsthesia well beyond that ordinarily required for the operation in progress or an endotracheal airway is indicated, the surgeon should permit him to complete the effort without hindrance. Manipulations that may be responsible for the patient's status should be suspended. Packs and retractors should be removed or readjusted and the position of the patient may need to be changed. The most disappointing, if not dangerous, situation exists when a disgusted surgeon struggles to operate in a rigid abdomen and the distressed anæsthetist vainly strives to adjust the anæsthesia while the patient suffers from increased trauma and inadequate surgery. It is a mistake to work under such conditions in an effort to relieve a bad situation as quickly as possible. It often follows that the operating time is increased, and usually the patient's condition at the completion of the procedure is less favourable.

Methods apart from increasing the degree of narcosis have been suggested to relieve the difficulties encountered with "traction reflexes". Pascalis[18] suggested the prophylactic use of eserine, and it has been employed in treatment. In the presence of induced sympathetic reflex activity a favourable result in laboratory animals follows the intravenous injection of this agent.[7] Clinically, the indication for its use has not presented often enough to justify deductions as to the efficacy of the treatment. Impressions from the few cases observed have not been unfavourable. It is established with some certainty that a favourable outcome may often follow complementing or supplementing the anæsthetic agent in use with another drug. When difficulties are encountered while using cyclopropane ether may change the situation, or vice versa. A procedure of considerable value that deserves consideration is the use of regional anæsthesia in conjunction with inhalation narcosis. A field block may be prepared before operation, or an injection within each rectus sheath may be accomplished after the skin is incised and before the peritoneal cavity is opened. An anterior splanchnic block or merely infiltration of anæsthetic solution in the area of the plexus may be used. Employing combined regional anæsthesia and inhalation narcosis definitely minimizes "traction reflexes". Satisfactory relaxation is secured without deep narcosis or a dangerous amount of inhalation agent in the tissues. During such anæsthesia, respiration is more adequate, since intercostal activity need not be abolished. The endotracheal airway may still be employed. Circulatory depression from deep anæsthesia is largely eliminated. An added hazard is the possibility of toxic reactions from the drug used in nerve block, but weak concentrations and only small amounts of solution are needed. It must not be inferred that regional anæsthesia together with inhalation narcosis gives the surgeon license to apply traction or mutilate tissues as he may choose. Trauma within the abdominal cavity takes its toll from the patient regardless of the anæsthetic employed. Anæsthetic and surgical morbidity and mortality will be decreased and operating conditions improved when the surgeon and the anæsthetist each recognizes his

obligation and cooperate to eliminate untoward reflex reactions.

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RENAL SYMPATHECTOMY*

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NERVOUS patients suffering from chronic recurrent attacks of colic in one or both loins, frequently associated with indigestion and chronic abdominal pain, have long been a problem to both physicians and surgeons. Many of these patients have had one or more operations for such ailments as appendicitis, cholecystitis, adhesions, and salpingitis without relief. The majority finally find their way into the free clinics and are absorbed into that large group of patients termed "neurotics".

It is only in recent years that a few of these patients have been rescued from this unfortunate group by further careful investigation with particular reference to the urinary tract. During the past ten years an increasing amount of evidence has been collected to show that a few of these patients are suffering from a true organic lesion in the kidney, pelvis, and ureter due to neuromuscular incoordination. Harris[1] believes that this is due to an overactivity of the sympathetic nervous system, and has coined the term "renal sympathetico-tonus" for this condition. It must be emphasized at the very beginning however that this diagnosis is not to be made in haste. All other pathological causes must first be ruled out, or corrected, and following this it is wise to keep the patient suspected of having this lesion under careful observation and medical care for some time before deciding on surgical treatment.

It is now well recognized that the calyces and pelvis of the kidney constitute a hollow muscular viscus, subject to autonomic nervous control. This viscus undergoes rhythmical contractions which begin in the calyces and sweep down the pelvis into the ureter (Fig. 1). Normally this is followed by relaxation, just as in the heart. Hence the terms "systole" and "diastole" may well be applied here. Jona,[2] Harris and others have demonstrated that renal pain and eventually dilatation of the calyces and pelvis result when this rhythmical sequence is disturbed. They believe that this is due to neuromuscular imbalance which can be relieved by drugs which paralyze the sympathetics, or corrected permanently by renal denervation.

The kidney is supplied by nerves from the autonomic system only. The preganglionic fibres emerge from the lateral horn of the grey matter of the lower eight thoracic and upper two lumbar segments of the spinal cord (Fig. 2). Axons from connector cells in these lateral horns leave the spinal cord in the anterior spinal nerve roots, enter the mixed spinal nerve and its anterior primary division, and pass from the latter in the white rami communicantes to reach the ganglionated sympathetic trunk. Those fibres intended for abdominal viscera remain preganglionic and pass directly through the sympathetic trunk without synapsis. They then emerge as thoracic and lumbar splanchnics and terminate in one of the great abdominal ganglia or plexuses.

Properly speaking there are three splanchnic nerves. (1) The superior or greater, arising from thoracic segments 5 to 9 inclusive (Fig. 3). The various branches unite, pass through the crus of the diaphragm and end directly in the outer part of the cœliac ganglion. Some filaments may proceed directly to the adrenal. (2) The middle splanchnic nerve arises from thoracic segments 10 and 11, pierces the crus and ends in the renal plexus or the aortico-renal ganglion. (3) The inferior or least splanchnic (inconstant) arises from the 12th thoracic, passes beneath the medial lumbo-costal arch to go to the renal plexus, aortico-renal ganglion, or the inter-mesenteric nerve plexus. In addition to these, the 1st and 2nd

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lumbar segments of the lateral horn also furnish innervation to the abdominal viscera.

Having traced, in general, the sympathetic outflow from the cord to the various abdominal ganglia and plexuses, let us consider the various routes by means of which the kidney, calyces, pelvis, and upper ureter receive their nerve supply from these ganglia and plexuses. The nerves going to the kidney accompany the renal vessels and arise from four sources, *viz.*,

1. From the aortico-renal ganglion which is the lower lateral part of the cœliac ganglion (Fig. 4), which forms a dense plexus around the origin of the cœliac and superior mesenteric arteries. It is held that this ganglion receives fibres from the superior and middle splanchnics, and is probably innervated also by branches from the vagi, opposite renal plexus and right phrenic by communications through the cœliac plexus. Nerves from this ganglion pass *via* three to eight branches along the superior border of the renal artery to the kidney pelvis, and form with the other renal nerves a complicated network encircling this vessel.

2. From the middle and inferior splanchnic nerves. Both of these may terminate in the aortico-renal ganglion or go directly to the posterior part of the renal plexus itself. On occasion the inferior splanchnic first communicates with the intermesenteric plexus. Since these two splanchnics, from segments ten, eleven, and twelve, often proceed to the renal plexus directly it is assumed they are directly related to renal innervation.

3. Intermesenteric nerves — whose renal branches arise from two points: (*a*) at the level of the kidney hilum to pass directly to the renal plexus; (*b*) at the outermost part of the lower portion of the intermesenteric plexus. One or two fine filaments, which may communicate with the inferior mesenteric plexus or highest spermatic nerves pass to the lower part of the renal plexus.

4. From the 1st and 2nd lumbar ganglia (inconstant). These may join the posterior part of the renal plexus near the termination of the inferior splanchnic or unite with the renal branches from the intermesenteric plexus.

The ureter in its upper part receives its innervation from the lower portion of the renal plexus or from the intermesenteric plexus.

The parasympathetic nerve supply of the kidney is as yet unsettled. Vagal fibres possibly reach the aortico-renal ganglion but have not been traced further. Japanese workers[3] say that certain parasympathetic fibres are found in the splanchnics and exert a definite secretory influence on the kidney. Their work requires further confirmation.

Having now a definite picture of the nerve supply of the kidney, let us investigate the functional and anatomical changes found in the kidney when the neuromuscular mechanism is in a state of imbalance.

Harris divides the pathogenetic process found in renal sympathetico-tonus into three phases.

1. Primary phase.—A stage of overactivity and irritability of the renal pelvis and calyces. Pyeloscopy and pyelography frequently show little change except spasm in the calyces or pelvis.

2. Intermediate phase.—This phase is characterized by a gradual loss of the power of rhythmical contraction. This has been well demonstrated by pyeloscopy. Pyelography reveals mild dilatation of the pelvis, clubbing of the calyces, and definite increase of the emptying time of the pelvis.

3. Final phase.—A stage of more or less well developed hydronephrosis. A well marked

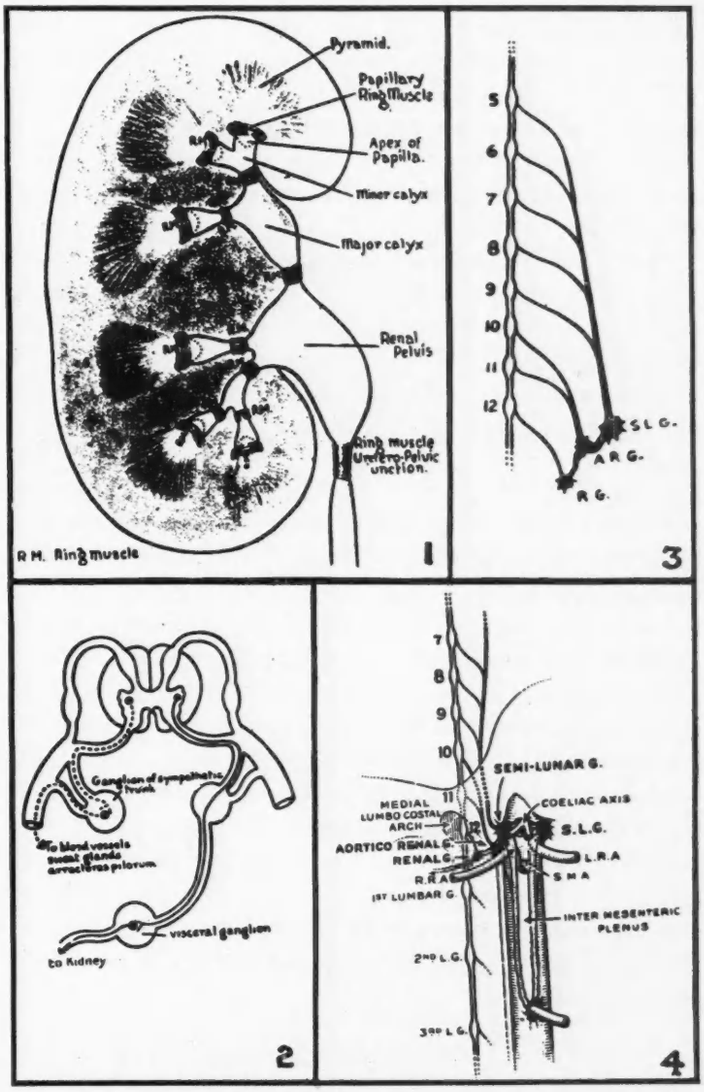


Fig. 1.—(From Kelly and Burnham's Textbook). Kidney showing calyces, pelvis, and ureter with definite ring muscles. **Fig. 2.**—Diagrammatic sketch showing path of preganglionic sympathetic fibres as they pass from the spinal cord to the large abdominal sympathetic ganglia. **Fig. 3.**—Diagram to show origin of (1) greater splanchnic nerve from the 5 to 9 thoracic segments (inclusive) and terminating in the semilunar ganglion; (2) lesser splanchnic nerve arising from 10 and 11 thoracic segment and terminating in the aortico-renal ganglion, and (3) least splanchnic nerve arising from the 12th thoracic segment and terminating in the renal ganglion. **Fig. 4.**—Diagrammatic sketch showing relationship existing between splanchnic nerves, diaphragm, cœliac axis, ganglia and renal artery. The intermesenteric plexus is also present but its connection with the renal plexus is not shown.

fibrous constriction and kinking of the pelvi-ureteral junction is frequently found. Nephroptosis is common, and the emptying time of the pelvis is greatly lengthened and the function of the kidney greatly decreased.

SYMPTOMATOLOGY

Renal sympathetico-tonus is confined chiefly to females. These women are usually in indifferent health, tire easily, and, in the occasional case reported, have been completely incapacitated. A well marked neurotic element is common, a factor which not uncommonly makes one hesitate to make the diagnosis of a true organic lesion. The symptoms have been present in most cases for several months or years, usually with a definite history of remissions. They may be enumerated as follows.

1. *A chronic dull ache in the loin* associated with an occasional attack of renal colic. The pain is usually unilateral, aggravated by hard work and relieved by rest. The attacks of colic may be associated with nausea and vomiting, and are more common in the earlier stages of the disease.

2. *Abdominal pain and indigestion.*—This is not uncommon. Pain is frequently complained of in the left iliac fossa. This is explained by the fact that although the intermesenteric and inferior mesenteric plexuses supply the left half of the colon some fibres pass to the renal plexus.

3. *Hæmaturia.*—This may be caused by spasm in the spiral muscle of the renal papillæ. Harris has reported a case cured by sympathectomy.

4. *Anuria.*—Anuria may be caused by too great sympathetico-tonus. One of our patients had several attacks of anuria which have not recurred since operation.

5. *Dysuria, frequency, urgency, polyuria, and strangury* are reported in some cases, but are not characteristic.

DIAGNOSIS

The affected kidney may be palpable, enlarged, and freely movable. The size depends a good deal on the stage of the disease. Both kidneys may be involved. Costovertebral tenderness on percussion and palpation is invariably present. It is exceptional for abnormal contents to be detected in the urine. Rarely a trace of blood is found, and, if pyelitis be present, pus and organisms. X-ray examination of the urinary tract may show one or both kidneys ptosed, in some cases the painless kidney being the lower. Calculi are unlikely in the early and intermediate stages but are a possibility in the advanced stages.

Excretory urography has not been used extensively in our series of cases. In our hands, especially in cases of hydronephrosis, the detail has not been sharp enough, frequently necessitating retrograde pyelograms being taken at a later date. In cases with well marked hydronephrosis, however, it is possibly safer than retrograde pyelograms as we have found that it is extremely easy to infect a large hydronephrosis. Some surgeons favour the use of excretory urography in pyeloscopy as it does not artificially dilate the kidney pelvis and calyces, and it does present the normal functioning of the calyces, pelvis and pelvi-ureteral junction. Our experience with pyeloscopy has been limited to a few cases, but we are convinced that it is a valuable procedure if properly carried out.

Cystoscopic examination in our hands has been the most useful and certain method of diagnosis. Our routine is as follows.

(*a*) *Bladder inspection* (usually a normal bladder). (*b*) *Intravenous indigo-carmine test.*—In early cases we have found the appearance, time, and concentration of the dye are little, if at all, affected. In more advanced cases the size, frequency, and colour of the spurt are diminished. In some cases the output of dye has been nil up to one-half hour. (*c*) *Retrograde pyelography.*—Four important facts are elicited by this procedure. (1) *Pain distension test.*—Sodium iodide is injected into the kidney pelvis until mild discomfort in the kidney is experienced. The amount required depends on the stage of the disease. In some of our mild cases as little as 3 c.c. produced pain. The pelvis is frequently found to be of smaller capacity than that of the opposite normal kidney. (2) *Character of the pain.*—When the kidney pelvis is distended with sodium iodide in cases of sympathetico-tonus the patients usually are quite positive that this is the pain they constantly suffer from. Occasionally it is more severe, but similar in character and position. This is a good confirmatory sign. (3) *Pyelogram.*—The picture naturally varies with the stages of the disease. Care is taken not to produce over-distension of the pelvis. In early cases one commonly finds the pelvis smaller on the diseased side than on the normal side. Spasms in the calyces, pelvis, and upper ureter

are not uncommon. In the intermediate phase mild dilatation of the pelvis and clubbing of the calyces will be apparent. In advanced cases a frank hydronephrosis will be revealed. (4) *The emptying rate of the pelvis.*—Normally a pelvis will empty at the rate of 1 c.c. per minute. In renal sympathetico-tonus cases delay is usual; this constitutes a significant observation.

TREATMENT

The surgery of the sympathetic nervous system is based no longer on theory but on sound anatomical and physiological facts. Sympathectomies in general are done for three reasons: (1) to relieve vasomotor spasm (Raynaud's disease); (2) to relieve pain (dysmenorrhœa); (3) to relieve muscular spasm (Hirshsprung's disease). There are now sufficient experimental and clinical data to show that all three factors are present in the kidney in this so-called renal sympathetico-tonus. There is also positive proof that complete denervation does not destroy or lessen the function of the kidney, but rather increases the function and renders it more immune to infections. This is probably due to its effect on glomerular function.

We have made it a rule always to keep these patients under observations for a period of time on some form of medical treatment before suggesting surgery. We have consistently used eserine in doses of 1/100 c.c. of a grain t.i.d., and find that in some cases it permanently relieves the pain. In other cases the patient gets relief while using the drug, the pain recurring when it is discontinued. This is usually a good indication for surgical treatment. Before proceeding to surgical denervation it is essential to know that a healthy kidney is present on the opposite side.

TECHNIQUE OF OPERATION

The kidney is exposed by a curvilinear incision beginning over the 11th rib at the outer border of the erector spinæ muscle. This extends downwards along the outer border of this muscle to about 1 inch below the 12th rib and then curves forwards about 1 to 1½ inch above the iliac crest to about opposite the anterior superior spine. In thin patients the incision is shorter. After division of the skin, subcutaneous fat and fascia, Petit's triangle is defined, and a small oblique incision made in the dense fascia therein. Through this the external and internal oblique are first separated anteriorly from the underlying deep fascia by blunt dissection with the fingers and then divided. The latissimus dorsi posteriorly is treated similarly. The deep fascia is now punctured and opened in line of the incision, care being taken to avoid injuring the colon.

This exposes the yellow retroperitoneal fat surrounding the kidney. Taking care not to injure the ilio-hypogastric or ilio-inguinal nerves, the fat is stripped off the quadratus lumborum muscle medially to the outer border of the psoas, thus rotating the kidney forwards in its fatty capsule. The perirenal fascia and fat are then torn through at the medial and posterior border of the kidney, and by careful digital dissection the fatty and fascial capsule can be loosened and slipped over the outer border of the kidney. It is then pushed off the anterior surface of the kidney carrying the peritoneal reflexion with it. This dissection is carried medially until the entire renal pedicle is exposed and the kidney so mobilized that it can be delivered easily on to the loin. The vessels are then carefully separated by special blunt dissectors and retractors, and all sympathetic fibres, found chiefly above and below the renal artery, are removed. The vessels must be separated and denervated on all sides, as numerous cross branches, resembling the rungs of a ladder, run between the individual fibres. We have had two failures due, in our opinion, to incomplete denervation. As a result we believe it wiser to resect the renal and aortico-renal ganglion. The renal ganglion is usually absent, but if present will be removed in any thorough stripping of the pedicle. The aortico-renal ganglion may be easily exposed by displacing the kidney downwards, thus exposing the crus of the diaphragm. The greater splanchnic nerve is then defined piercing the crus of the diaphragm and is traced to the cœliac ganglion. The aortico-renal ganglion is found at its outer and inferior border, frequently fused with it. Resection of the aortico-renal ganglion is advised (Fig. 4).

The renal pedicle may be painted with 10 per cent carbolic acid after surgical denervation, thus paralyzing any fibres missed. We have had no experience with this procedure. In cases with well marked hydronephrosis, excision of redundant tissue and some form of uretero-pyeloplasty have usually been done. We feel, however, these are borderline cases and will not be dealt with here. Finally, we always suspend the kidney, after the method of Foley.[4] This is against the teaching of Harris and Oldham, both of whom believe such to be entirely unnecessary. Hess[5] has also shown that a kidney properly replaced stays up in position without sutures.

We wish to present ten case histories of patients in whom we have diagnosed renal sympathetico-tonus. I (A.C.A.) operated upon my first case in 1925. This was done in haste and I repented at leisure. Since that time I have been more exacting in my pre-operative requisites.

CASE 1

Mrs. T., aged 28.

March 15, 1925.—*Complaints.*—Pain in the right loin for 2 years, relieved by pressing upwards in right hypochondrium, associated with frequency.

Examination.—A thin woman with very poor muscles; visceroptotic. The right kidney could be brought down into the pelvis. Urine, normal.

Cystoscopic.—Bladder normal. The ureteral catheter passed normally. The function of both kidneys was normal.

The *pyelogram* showed early right hydronephrosis and hydro-ureter (upper 4 inches of ureter). Typical pain was produced on pelvic distension.

June 12th.—Partial sympathectomy and suspension.*

July 7th.—No relief.

October 25th.—Appendicectomy by another doctor in September, who states he cured all her pain.

CASE 2

Mrs. T., aged 39.

* A complete stipping of the renal pedicle was not carried out in this case.

January 22, 1929.—*Complaints.*—Mild indigestion resembling gallbladder disease; severe excruciating pain in the right lumbar region for 8 years. This came in attacks but she had a dull pain all this time. Large doses of morphine were required to relieve pain.

February 1st.—*Cystoscopic.*—Bladder normal. Dye, right and left, 4x in 4 minutes.

The *pyelograms* showed a right kidney dilated (grade II) with well marked kink in the ureter opposite the 4th lumbar vertebræ (horizontal). The pyelogram repeated in the upright position showed ptosis and rotation of the kidney. Typical pain was produced when sodium iodide was injected on the right side.

March 16th.—Sympathectomy and nephropexy of the right kidney.

October 22nd.—No pain. The kidney could be felt in deep inspiration.

January, 1931.—In good condition; absolutely no pain.

CASE 3

Mrs. B., aged 33.

September 24, 1929.—*Complaints.*—(*a*) A painful lump in the right hypochondrium, relieved by pressure. The pain was worse on working, relieved by lying down. Duration, years. (*b*) Frequency.

Examination.—Entirely negative, except for a painful, palpable, and mobile right kidney. Urine normal.

Cystoscopic.—Bladder normal. Dye right and left, 3 minutes, grade IV.

Pyelogram.—(*a*) Horizontal plates showed mild clubbing of the superior and inferior calyces, and spasm of the middle calyces (Fig. 5). Mild dilatation of the kidney pelvis (?). (*b*) Perpendicular plates showed prolapse and rotation of the kidney.

She was sent home with a belt, but this gave no relief.

October 4, 1930.—Sympathectomy and nephropexy.

June 2, 1932.—Very well; occasional pain felt after a long ride.

December 10, 1937.—Absolutely no pain.

CASE 4

Mrs. B., aged 60.

May 31, 1931.—*Complaints.*—Pain in the left hypochondrium; frequency; a lump in the left hypochondrium. Duration was years.

Examination.—Negative, except for some tenderness in the left costovertebral angle. No mass was felt.
carmine—right, 10 minutes – 4x; left, 4 minutes –

July 2nd.—*Cystoscopic.*—Bladder normal. Indigo-carmine, right, 10 minutes, 4x; left, 4 minutes, 4x. Distension of the left kidney pelvis caused typical pain. Intravenous dye showed a normal kidney on the right and mild dilatation with clubbing of calyces on the left.

March 22, 1933.—Same complaints. The patient was thoroughly re-investigated. The gall bladder was visualized normally. The barium series was normal.

Cystoscopic.—Normal bladder. Dye, right, 6 minutes, grade IV; left, 10 minutes, grade IV.

Pyelograms.—Right, normal. Left, increased clubbing of the calyces and dilatation of the pelvis. Typical pain was reproduced on pelvic distension (Fig. 6).

April 12th.—Left renal sympathectomy and nephopexy. During the course of the operation the ilio-hypogastric nerve was cut accidentally.

July 1st.—Pain all gone. Some bulging in left flank due to paralysis of nerve.

January, 1936.—Pain all gone. She complained of a "falling" sensation in the left flank.

December 15, 1937.—Well, except for bulging of loin due to original nerve injury.

Cystoscopic.—Indigo-carmine, right, 6 minutes, grade IV; left, 7 minutes, grade IV. No pain on distending the kidney pelvis while making a pyelogram. Pyelogram (Fig. 7) showed some rotation of the kidney due to faulty nephropexy.

CASE 5

Miss E.H., aged 24.

February 2, 1934.—*Complaints.*—Pain in both loins; frequency; inability to pass water easily.

Past history.—In September, 1933, she developed an acute pain in the right iliac fossa in the early morning; vomited. She was taken to hospital. The pain in the right iliac fossa subsided in a few hours, but pain developed in both loins and lasted a few days. She was discharged, normal.

In November, 1933, she developed pain in both loins and was anuric for 48 hours. This was associated with severe pain in both loins, greater in the left than the right. In December she had a similar attack, associated with nausea and vomiting and anuria for 48 hours. She was seen by her own physician who diagnosed a prolapsed left kidney.

February 10, 1934.—Cystoscopic examination showed a normal bladder. Indigo-carmine injected intravenously appeared from both kidneys in four minutes; grade IV concentration.

Pyelograms.—Right, ptosis of right kidney, grade II, with no pelvic changes. Pelvis emptied in normal time; capacity, 5 c.c. Left, ptosis of left kidney, grade II, with mild clubbing of calyces. Distending the pelvis while making the pyelogram produced typical pain. The kidney pelvis capacity, 12 c.c.; emptying time 20 minutes.

February 19th.—Left sympathectomy and nephropexy. Uneventful recovery.

December, 1937.—She had been well ever since. Cystoscopy revealed normal function in four minutes with indigo-carmine, painless distension of kidney pelvis, and a normal pyelogram.

CASE 6

Mrs. B., aged 42.

March 3, 1934.—*Complaints.*—Acute attacks of pain in left loin for 15 years; blood in the urine.

Examination.—Negative except for pain in left loin.

Cystoscopic.—Bladder normal. Catheter passed normally. Right, drips normally, dye, 6 minutes, 4x; left, drips slowly, clean, colourless fluid, dye, nil in 20 minutes.

Pyelograms.—Right, normal. Left, early hydronephrosis. Right, angled kink 1 inch down ureter. Ureter, no dilatation. After 20 minutes the pelvis was still full. Positive kidney pain.

March 17th, operation.—A large flabby kidney; no aberrant arteries. Left nephropexy and sympathectomy.

April 12th.—*Cystoscopic.*—Dye, left, 12 minutes, 3x. *Pyelogram.*—In good position and empties in time.

April, 1936.—In excellent position.

CASE 7

Miss V.N., aged 29, a thin neurotic type and a chronic complainer.

April 1, 1937.—Complained of pain in the right loin referred to right groin and mild pain in the left loin; the pain was worse on walking and working and relieved by rest. Frequency. Sleeplessness. Losing weight (30 lbs.). Nausea following meals.

Past history.—Cholecystectomy and appendicectomy, December, 1935. Pathology questionable.

Examination.—Blood pressure 120/70; pulse 96. Weight 114 lbs. The nose and throat were normal; the thyroid negative. Heart and lungs negative. Abdominal examination negative except for pain on pressure in the right and left loins. Percussion over kidney also caused pain. Pelvic viscera, negative except mild thickening in right fornix. Urinalysis: 1.008, acid, albumin 0, sugar 0, microorganisms negative; red blood cells 4,600,000; white blood cells 9,200; hgb. 78 per cent; basal metabolic rate +5. Gastric analysis normal. A bismuth series was normal.

April 5th.—Cystoscopic examination (in office). Bladder normal, dye, right and left, 6 minutes, grade III concentration. Bladder capacity 20 ozs.

April 20th.—Admitted to hospital.

Cystoscopic.—Indigo-carmine was given and appeared from right and left in grade III concentration

in 5 minutes. Catheters were passed and specimens collected for culture which proved to be negative. Right kidney capacity, 4 c.c., typical pain; left kidney capacity, 3½ c.c., typical pain.

Pyelogram (right).—Spasm of ureter one-half inch below pelvi-ureteral junction with spasm of calyces. Emptying time on right 12 minutes.

She was placed on eserine sulphate with no effect.

We re-examined this patient on May 28, 1937, June 15, 1937, and July 7, 1937, with the same complaints. We finally decided that a renal sympathectomy was indicated, in spite of failure to get relief with eserine sulphate.

July 16th.—Right renal sympathectomy and nephropexy, with uneventful recovery.

October 1st.—All pain in the right kidney was gone. The pain in the left kidney was the same and she requested an operation for its relief.

October 10th.—*Cystoscopic.*—Dye, right, grade IV, in 4 minutes; left, grade III, in 6 minutes. Typical pain in the left was produced; no pain in right with 10 c.c. sodium iodide.

October 22nd.—Left renal sympathectomy and nephropexy. Uneventful recovery.

December 10th.—Pain still persisted in the left kidney; right, normal.

December 18th.—*Cystoscopic.*—Dye, right and left, grade III, in 3 minutes. Positive pain in left kidney with 2 c.c. sodium iodide.

Pyelograms.—Two attempts to fill the left kidney pelvis were made. Both showed incomplete filling with a very spastic upper ureter and also sharp angulation at the pelvi-ureteral junction (Fig. 8).

Comment.—Obviously this operation has been successful on the right but a total failure on the left. We feel that it is a technical failure and not one of principle.

CASE 8

Mrs. K., aged 39.

October 28, 1936.—*Complaints.*—Pain in both loins for 11 months, worse on working and relieved by rest; vaginal discharge.

Past history.—Pleurisy in 1935; bilateral salpingectomy in 1933; appendicectomy in 1917.

Examination.—A complete physical examination, including a bismuth series; gall-bladder visualization was negative: mild endocervicitis, and some thickening in both fornices. The lower poles of both kidneys were palpable.

Cystoscopic.—Bladder normal. Dye, right, grade III, in 5 minutes; left, grade III, in 7 minutes. Pelvic capacity, right, 6 c.c. sodium iodide with typical pain; left, 5 c.c. sodium iodide with typical pain.

Pyelogram.—Right, mild dilatation of kidney pelvis and upper calyx. Uretero-pelvic junction distorted and there was spasm of the upper ureter. Emptying time 13 minutes. Left, mildly dilated or large upper calyx. A small kink was found about 2 inches below the pelvi-ureteral junction with dilatation of ureters above this. Emptying time 9 minutes (Fig. 9).

The patient was placed on eserine sulphate, grs. 1/100 for one month with some, but not complete relief.

November 28th.—Left renal sympathectomy and suspension. The peritoneum was opened deliberately and the abdomen explored and found negative at the same time. Uneventful recovery.

March 12, 1937.—No pain in left kidney since operation; the right kidney quite painful.

March 16th.—*Cystoscopic.*—Dye, right, grade III, 7 minutes; left, grade II, 4 minutes.

April 15th.—Right renal sympathectomy and nephropexy. Uneventful recovery. All pain was gone for about two months when the patient began complaining of pain in the right loin again.

December 7th.—*Cystoscopic.*—Bladder normal. Dye, right, grade III, 6½ minutes (capacity 10 c.c. with pain); left, grade III, 4½ minutes (capacity 12 c.c., no pain) (Fig. 10).

Here again we feel we have failed to do a complete denervation on the right kidney.

May, 1938.—A second attempt was made on this kidney in an endeavour to resect the aortico-renal ganglion. The kidney was found to be very adherent and hard to loosen up. The ganglion could not be found. The patient is still in hospital.

CASE 9

Miss A.LaF., aged 28.

September, 1935.—*Complaints.*—Pain in the right lower quadrant referred to the loin, worse on working, walking and jarring. No frequency. Mild gallbladder symptoms such as inability to eat greasy and fatty foods, cabbage, etc., associated with gaseous distension.

Past history.—Appendicectomy 6 years ago for the same symptoms. Tuberculosis of the kidney was recently diagnosed.

Examination.—Investigation was negative for tuberculosis of the lungs or genito-urinary tract.

Cystoscopic.—Bladder normal. Dye, right and left, grade IV, in 4 minutes. Cultures negative.

The *pyelogram* was normal. The picture was retaken in the erect posture and the kidney slipped down to brim of pelvis. Her typical pain, however, was reproduced after injecting 6 c.c. of sodium iodide. The kidney also could be grasped and moved around, was very tender, and the patient was positive that this was her typical pain. The bismuth series was normal. The gallbladder was visualized normally. The x-ray showed a questionable shadow, but it was reported negative on further examination.

October 15, 1937.—Right renal sympathectomy and nephropexy. The abdominal cavity was not opened for exploration. Recovery was uneventful except for left phlebitis.

Since that time we have had the girl constantly under observation. She stated that on occasion she has had a little pain in the right upper abdomen but nothing like her old pain. She still had some nausea occasionally.

December 26th. — *Cystoscopic.* — Bladder normal. Dye, right and left, grade IV, in 5 minutes.

Pyelogram (right).—Capacity 5 c.c., mild pain. X-ray showed a normal pelvis. The kidney was normal in position.

CASE 10

Mrs. S.

May 2, 1936.—*Complaints.*—Pain in the epigastrium and right loin for 18 months; occasional nausea and epigastric burning.

Past history.—Negative.

Examination.—Thyroid, diffuse enlargement. Basal metabolic rate, +7. Bismuth series normal. Gastric analysis normal. Gallbladder visualization normal. Pelvic examination was normal.

Cystoscopic.—The bladder was normal. Dye, right, 12 minutes, grade II, no spurt; left, 8 minutes, grade III.

Pyelogram (right). — Hydronephrosis, grade II; capacity 25 c.c. with positive pain test. A right-angled kink was noted in ureter just below pelvi-ureteral junction (Fig. 11).

May 14, 1937.—Renal sympathectomy and nephropexy. There was an aberrant vessel to the lower pole, not interfering with the ureter which was left intact. Renal artery very small. No fixed kink found in ureter. Recovery uneventful.

June 4th.—*Cystoscopic.*—Dye, right, 6 minutes, grade IV, 25 c.c. Sodium iodide was injected into pelvis without pain. The pyelogram showed a smaller pelvis and no kinking of the ureter (Fig. 12).

December.—A letter from the patient stated that she had had no pain since her operation, and the burning sensation in the epigastrium associated with neausea had disappeared.

SUMMARY

1. The present day knowledge of the autonomic nerve supply of the kidney is described and illustrated.

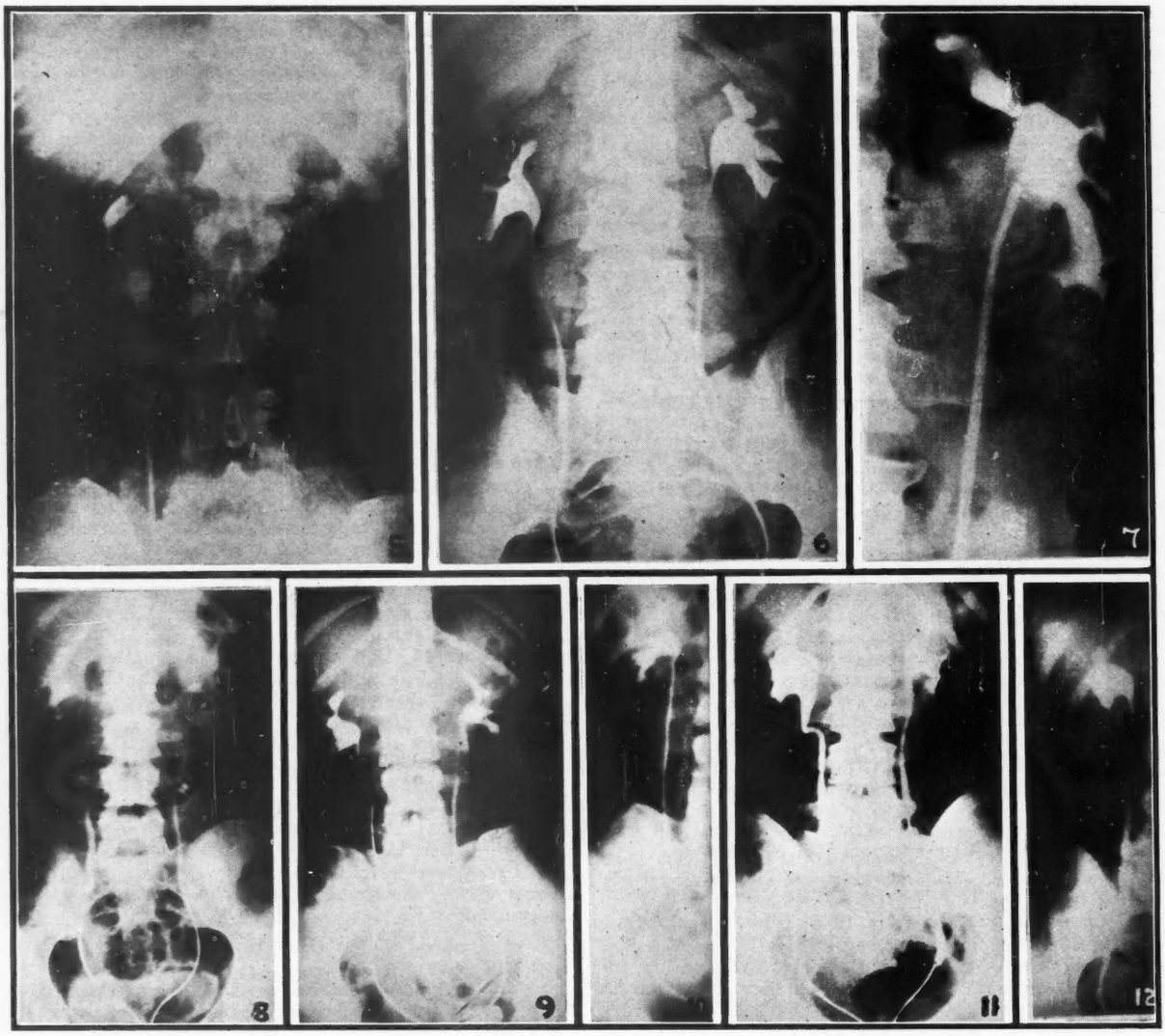


Fig. 5.—Pyelogram in horizontal position showing mild hydronephrosis with clubbing of calyces. A plate taken in perpendicular position showed kidney prolapsed to the brim of the pelvis. (Plate too poor for reproduction). **Fig. 6.**—Bilateral pyelograms right and left kidneys in Case 4 before operation. The right kidney is normal. The left kidney pyelogram shows clubbing of calyces and dilatation of pelvis. **Fig. 7.**—Pyelogram of left kidney of Case 4 taken four years later. The kidney is rotated by error in suspension. There was no pain produced in distending the kidney pelvis. **Fig. 8.**—Bilateral pyelogram of Case 7 three months after sympathectomy. Note the spasticity of the left kidney and upper ureter. **Fig. 9.**—Bilateral pyelograms in Case 8 showing dilatation of pelves and calyces in both kidneys. Sympathectomy done on left side with relief but operation on right side proved a failure. **Fig. 10.**—Pyelogram of right kidney eight months following sympathectomy. Distension of kidney pelvis caused pain indicative of failure to completely denervate the kidney pelvis. Note high position of kidney. **Fig. 11.**—Bilateral pyelograms in Case 10. Left kidney pyelogram normal. Right pyelogram shows hydronephrosis grade II (25 c.c. capacity). Note the right-angled kink in the ureter just below pelvi-ureteral junction. This was not evident at operation. **Fig. 12.**—Pyelogram of right kidney before patient left hospital. Note absence of a kink in the ureter. Pelvis is smaller and distension caused no pain.

2. The symptom-complex of painful kidneys requiring sympathetic denervation for relief of pain is set forth. The symptoms vary, but usually consist of chronic pain in the loin associated with some form of abdominal pain and indigestion. Most of these patients in the past have been classified as neurotics.

3. The diagnosis depends chiefly on careful cystoscopic investigation. The points of most significance are renal stasis, mild hydronephrosis, and the production of the typical pain on distending the kidney pelvis with fluid.

4. It is strongly emphasized that all other pathological processes must be ruled out before diagnosing a renal sympathetico-tonus. Only in this way will a worthy surgical procedure be prevented from falling into disrepute.

5. The surgical technique is described.

6. Although the series presented is a small one it represents thirteen years' experience with renal sympathectomy in carefully chosen patients. It is our considered opinion that the results obtained have justified the procedure in such cases.

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BILATERAL LOBECTOMY FOR BRONCHIECTASIS*

(PRESENTATION OF TWO CASES)

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UNILATERAL lobectomy for bronchiectasis has now become a common operation. With improvement in operative technique and anæsthesia and early recognition of the disease by bronchograms the mortality rate has dropped from 61.8 per cent, as reported by Lilienthal[1] in 1935, to approximately 10 per cent, reported by various authors. Churchill,[2] in a recent article, reports a mortality rate of 2.6 per cent in 38 cases, and in the last 30 cases he has done there have been no deaths.

Bilateral lobectomies, on the other hand, have been infrequent, only 9 being reported, 5 of these by Churchill,[2] with one death, and 1 each by Eloesser,[3] Lewis,[4] Edwards,[5] and Overholt,[6] with no deaths. If one includes the 2 cases here reported the total is 11, with 1 death, or a mortality rate of 9.9 per cent which approximates that of the unilateral lobectomy.

The most important single factor affecting the death rate would seem to be the stage of the disease at which operation is carried out. Archibald[7] divides the condition into three stages, the first being purely bronchitic with no bronchographic changes; the second stage showing cylindrical and saccular dilatation, cough and copious muco-purulent sputum, which on culture yields a mixed group of organisms, but no anaerobes, the third or fœtid stage characterized by quantities of foul-smelling sputum, containing anaerobes, bronchograms revealing large bronchiectatic cavities.

With the general use of bronchograms and the recognition of bronchiectasis before it has progressed to the fœtid stage, and operation at this point, the chances of a fatal empyema are considerably lessened. The choice of a one- or two-stage operation is also of considerable importance. In all our cases the latter has been chosen as we feel that by the production of adhesions, and therefore a smaller area of pleura exposed to infection, convalescence is much smoother and less likely to lead to fatal complications; in addition the adherent lung is utilized by the patient during the operation, and is not flapping in the pleural cavity.

Spinal anæsthesia in conjunction with a preoperative dose of scopolamine and morphine is preferable to other types, in that there is apparently less shock to the patient and not so much struggling and coughing, as was experienced with avertin and intratracheal gas or other kinds of inhalation anæsthesia.

CASE 1

T.L., a white female, aged 5 years, was admitted to the Medical Outdoor, Children's Memorial Hospital, Montreal, on May 4, 1931, with complaints of chronic cough, and purulent sputum, following an attack of pneumonia one year previously. A note by the examining physician stated that she was pale, irritable, with some clubbing of the fingers; had enlarged and infected tonsils; fine moist râles could be heard on both sides of the chest. Nourishment, good.

The tonsils were removed in July, 1931. She was not seen again until July, 1932, when a diagnosis of bronchiectasis of both lower lobes was made. Cough and sputum were still present, also a chronic sinusitis. On July 22, 1932, she was admitted to hospital on account of cough and foul-smelling sputum. With the exception of the above there was no other pertinent history. Endonasal drainage was performed.

On October 24, 1932, she was admitted for cough and dyspnœa. Bronchoscopic and lipiodol injections showed definite evidence of bronchiectasis. Postural drainage was carried out while in hospital and continued at home following her discharge, together with weekly aspiration through a bronchoscope. She continued this treatment over a period of six months and then stopped the bronchoscopic aspirations, although continuing postural drainage.

Between this time and June 10, 1938, she continued to attend the Medical Outdoor off and on, her cough and sputum not diminishing. She was seen by the surgeons on June 10, 1935, and admitted to hospital, with the idea of further investigation and possible lobectomy.

June 19, 1935.—Lipiodol injection revealed definite bronchiectasis of the right lower lobe with some in-

* Presented before the Canadian Society for the Study of Diseases of Children, June, 1938.

dication in the left lower lobe. Between June 10, 1935, and July 10, 1935, the patient was postured for one hour b.i.d., the sputum amounting to 3 to 4 oz. in twenty-four hours. Culture of sputum revealed fusiform bacilli and spirochætes, together with streptococci and staphylococci.

On July 10th, initial pneumothorax was induced on the right side, and by July 24th, 75 per cent collapse having been obtained and carried without any embarrassment, the surface of the lung was powdered and the air immediately aspirated, following this for a

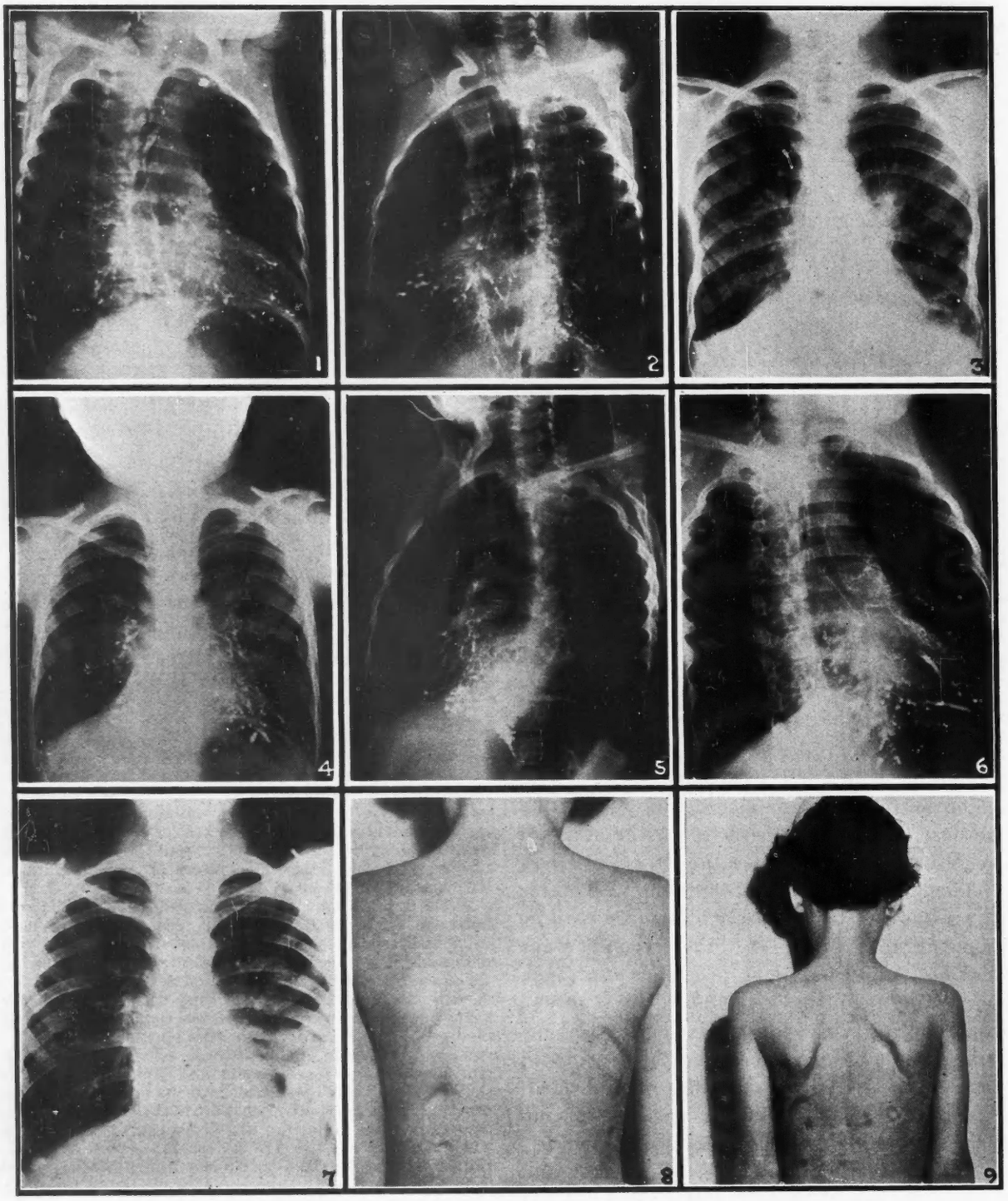


Fig. 1.—A.S., showing saccular and cylindrical dilatations of bronchi of left lower lobe. **Fig. 2.**—A.S., showing saccular and cylindrical dilatations of bronchi of right lower lobe. **Fig. 3.**—A.S., showing condition of lungs following bilateral lobectomy. Note still some bronchiectasis at the left lower base, April, 1938. **Fig. 4.**—T.L., September, 1933. Triangular shadow atelectatic lobe, right base and moderate bronchiectasis at left base. **Fig. 5.**—T.L., June, 1935. Bronchiectasis very marked in atelectatic lobe. **Fig 6.**—T.L., September, 1937. Showing progress of the bronchiectasis at left base as compared with September, 1933. **Fig. 7.**—T.L., April, 1938. Condition of chest following bilateral lobectomy. **Fig. 8.**—A.S., May, 1938. Note absence of deformity. **Fig. 9.**—T.L., May, 1938. Note absence of deformity.

few days there was an elevation of temperature, but no other symptoms.

October 8, 1935.—An incision made between the 7th and 8th ribs, extending from the anterior axillary line in front to the midscapular line behind. The 7th and 8th ribs at the extremities of the incision were exposed and cut across. On incising the pleura the lung completely collapsed, and there being no adhesions, the surface was lightly sponged with 2½ per cent iodine, the wound then completely closed, and the air aspirated from the chest. Convalescence was uneventful.

November 5, 1935.—The previous scar was excised and exposure of the pleural cavity made in the same manner as above described by the late Dr. F. A. Scrimger. This time there were excellent adhesions. The right lower lobe was seen to be quite black and collapsed. It was removed, together with a small accessory lobe, in the cardiophrenic angle. The wound was completely closed and a small stab wound made in the interspace between the 8th and 9th ribs, posterior axillary line, for closed drainage purposes. A transfusion was given before the patient left the table. Recovery was uneventful and the patient was discharged on November 20, 1935. Cough was still present although not so marked. The sputum measured 1 to 1½ oz. in twenty-four hours.

February 12, 1936.—Readmitted, still complaining of cough and sputum. Bronchograms revealed cylindrical and saccular dilatations in the left lower lobe, which were much more marked than on previous examinations. She remained in hospital until March 23, 1936. The sputum decreased, and there was improvement in her general condition. She was to carry on postural drainage at home. She was sent to a convalescent home on July 30, 1936, where she remained until September 15, 1937, when she was readmitted to the Children's Memorial Hospital, and as the sputum and cough had persisted, with no improvement in her general condition, it was decided to prepare her for excision of the left lower lobe. Initial pneumothorax, 80 per cent collapse, having been obtained in 12 days, the lung was powdered; no subsequent reaction.

She was readmitted, December 1, 1937, but as there were no adhesions the left lung was again powdered subsequent to obtaining 80 per cent collapse by pneumothorax. The reaction to this powdering was very marked, with temperature, pain in the right side of the chest, and a friction rub. As soon as these symptoms had subsided she was discharged, and readmitted on February 9, 1938. Excellent adhesions having formed, the left pleural cavity was opened, through an intercostal incision between the 6th and 7th ribs. On opening into the chest cavity the lower lobe was seen to have numerous darkened areas, particularly at the periphery. In the lowermost part of the upper lobe there were also some of these darkened areas. The lower lobe, together with a small part of the upper lobe was removed, the wound in the chest wall closed completely, and closed drainage, through a stab wound between the 8th and 9th ribs, posterior axillary line. A transfusion of citrated blood was given on the operating table.

Considerable difficulty was experienced with drainage. On March 19, 1938, a small piece of the 9th rib was resected in order to provide freer drainage. At this time a broncho-pleural fistula was found. From this date on convalescence was uneventful, cough and sputum gradually decreasing until by now she goes from 48 to 72 hours without coughing or bringing up any sputum. The broncho-pleural fistula has closed and the chest wound is completely healed.

The child's general condition has improved and there has been a gain in weight of 2¾ lbs. in the past two weeks. Vital capacity readings on May 26, 1938, with patient on the back, 50 per cent; tidal air 518 c.c.

CASE 2

A.S., a white female, aged 6½ years, was admitted to the Medical Outdoor on September 2, 1936, with a history of having had bronchitis at 2½ months. Since then she had had several attacks of bronchopneumonia, and the mother stated that on exertion, such as playing with other children, she manifested paroxysms of coughing accompanied by dyspnœa and cyanosis and had to be put to bed.

The child was well nourished. Nothing abnormal was found with the exception of clubbing of the fingers and coarse râles at both bases, more marked on the left than on the right.

September 5th.—Bronchoscopic examination showed a large quantity of mucopurulent material coming from both main bronchi and inflammation and œdema of the trachea. Lipiodol instillation showed bilateral dilatation of the bronchi of the lower lobe. While in hospital she was postured and brought up 2 to 3 oz. of non-fœtid mucopurulent sputum with each posturing. This latter, on culture, revealed mixed organisms, none of them anaerobic. In view of these findings lobectomy advised . . . the left side to be done first, as it was considered the worst.

November 23, 1936.—Initial pneumothorax, left side. By December 4, 1936, 85 per cent collapse of the lung having been obtained and a pressure of plus 1 to plus 4 carried without embarrassment, through a cannula inserted in the 6th interspace the collapsed lung surface was powdered with iodized talc. This wound was then immediately closed, all the air in the chest cavity aspirated so as to allow expansion of lung and adhesions to form between parietal and visceral pleural. Following poudrage the child developed a well marked friction rub, accompanied by pain and temperature, the latter subsided in a few days and she was discharged on December 15, 1936.

She was readmitted January 13, 1937, but discharged shortly after on account of measles.

April 5, 1937.—She was again admitted and on April 19th the left lower lobe was removed through an intercostal incision under avertin and intratracheal gas. The lobectomy wound was completely closed and drainage established through a stab wound and large catheter. Owing to inadequate drainage a section of the 9th rib, posterior axillary line, was resected on May 10, 1937. From this time on her convalescence was uneventful. On discharge from hospital on June 19th the sputum had decreased to one and a half ounces and the cough was less bothersome.

Readmitted on July 26, 1937. The drainage wound on left side was completely closed and her general condition excellent. (Vital capacity readings: May 31, 1938, on back, 50 per cent; tidal air 228 c.c.)

August 2, 1937, initial pneumothorax. August 13th, poudrage of the lung. Considerable difficulty was experienced in withdrawing all the air, and two days later there was a collection of fluid in the pleural cavity preventing expansion of lung.

September 16, 1937, under spinal anæsthesia, with a pre-operative dose of scopolamine and morphine, the right pleural cavity was opened through an intercostal incision between the 7th and 8th ribs. On opening the pleura the lung was seen to be completely collapsed, no adhesions having formed. The surface of the lung was therefore gently sponged with 2.5 per cent iodine, the wound completely closed, and air aspirated from pleural cavity. Convalescence was uneventful.

November 7, 1937, adhesions having formed, as proved by manometric readings, the right lower lobe was removed through an intercostal incision and drainage established by means of an intercostal stab wound. A transfusion of citrated blood was given on the table. Convalescence was uneventful, the tube being removed on the eighteenth day. She was ready for discharge by the twenty-fourth day.

Since discharge from hospital her general condition has remained excellent; there has been a slight cough with a small amount of sputum, insufficient in quantity to measure, and the clubbing of her fingers has disappeared. Her appetite is good and there is a steady gain in weight.

COMMENT

1. These two cases indicate that bilateral lobectomy can be performed without leaving any ill effects.

2. Bilateral lobectomy should have no greater mortality than the unilateral, providing it is carried out in Archibald's so-called "second stage", *i.e.*, before anaerobic organisms are present.

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CEREBRAL PNEUMOGRAPHY IN CHILDHOOD*

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THE term "cerebral pneumography" includes the procedures commonly known as encephalography and ventriculography. Both these forms of examination have been in rather general use for the past few years and have yielded valuable information. A brief summary of the type of cases that may be investigated by each of these methods and some of the more important findings will be attempted.

In encephalography spinal fluid is withdrawn by lumbar puncture and replaced with gas. In this manner the ventricular system and also the subarachnoid space are outlined, and in suitable cases more information is gained than by the use of ventriculography. A great deal of anatomical information is obtained, and from this one is in a much better position to make an accurate prognosis and to outline either operative or non-operative treatment. This method of examination is quite safe in patients who do not present increased intracranial pressure. The use of oxygen rather than air lessens subsequent reactions.

Although there is undoubtedly a certain amount of normal variation, the size of the normal ventricles is now fairly accurately established (Fig. 1). The shape of the lateral ventricles varies according to the shape of the head, that is, a dolichocephalic skull will have long, rather low-arched ventricles conforming to the general shape of the vault of the skull, whilst a brachycephalic will have lateral ventricles with a high arch, also conforming to the shape of the vault. The basal cisterns have been accurately described in the last few years and are very constantly shown. Many of the sulci are also regularly visible.[1]

Encephalography is quite safe in infancy provided that there is no clinical evidence of increased intracranial pressure. One of the most common indications for encephalography is suspected feeble-mindedness or backwardness. Many such infants suffer from convulsions. Some with convulsions may, when seen fairly early, appear relatively normal mentally. The majority of such infants present varying degrees of diffuse cerebral atrophy. This may be evidenced by large ventricles, one of which may be greater than the other, or the ventricles may be symmetrical. Very frequently there will be evidence of cortical atrophy in addition to the dilatation of the ventricles, and sometimes the cortical atrophy predominates and the ventricular atrophy is of minor degree. Not uncommonly extremely marked cerebral atrophy is shown. In such cases the prognosis is bad, and treatment will probably be of no avail. A smaller number of infants suffer from various types of paralysis. It is quite easy to determine whether these paralyses are central in origin and due to atrophy or to such causes as subdural or extradural hæmorrhage. In the case of a hæmorrhage the ventricles shift away from the expanding lesion, whilst with atrophy the ventricles enlarge and tend to shift toward the atrophic lesion.

Similarly, in birth injuries encephalography is sometimes advisable to see if there is evidence of an intracranial hæmorrhage which may be evacuated. Hydrocephalic infants are a rather different problem, but many of these have a

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communicating type of hydrocephalus, the obstruction being in the subarachnoid space so that the absorption of spinal fluid is prevented. In these cases cautious encephalography may reveal the site of the block more conclusively than ventriculography.

In reviewing a series of films it becomes apparent that a very high percentage of infants investigated by means of encephalography present evidence of very gross cerebral atrophy. Presumably this is due to the fact that at this age only the more definitely abnormal cases have been investigated, whilst in older children cerebral damage may be much less marked but gives rise to more obvious symptoms.

Now let us pass to the older children. Mental retardation is not uncommon, and in most of these cases varying degrees of diffuse cerebral atrophy are found. This usually results in a greater or lesser degree of ventricular dilatation, and at this age very pronounced cortical atrophy is not so common. Often there is no way of determining the cause of the cerebral atrophy, but in other patients there is a definite history of some form of encephalitis, such as may be due to lead, whooping-cough, measles, etc. In certain cases we are able to show post-traumatic atrophy (Fig. 2); this may be quite diffuse, but frequently is principally focal. Somewhat similar findings are noted in cases of spastic paraplegia or diplegia. Sometimes only minor abnormality is revealed, but often there is marked general atrophy. Occasionally, obvious idiots show very little cerebral atrophy, indicating that total brain volume is not necessarily the only important factor. Microcephalics tend to have large ventricles; there has been no stimulus from the growing brain to cause the cranium to increase in size.

In many respects the most important findings are those encountered in epilepsy. It has been previously noted that infants with convulsions often have very marked general atrophy. This is also noted in some of the older children. In such cases there is evidence of irreparable damage, and there is practically no hope of a favourable result from any form of treatment. Fortunately a great many cases do not fall into this category. I should like to stress the fact that encephalography does not reveal any definite cerebral abnormality in a large number of epileptics. In such cases medical treatment is indicated and often produces marked improvement or even apparent cure. Another group of patients presents evidence of focal cerebral damage, commonly associated with cicatrix formation (Fig. 3). Unfortunately some of these also show evidence of very marked general atrophy, and the outlook is discouraging. A fair number show localized damage with evidence of scarring without any great general cerebral atrophy, and these cases are quite frequently either apparently cured or at least considerably improved by neurosurgery. Sometimes there is a definite history of a local insult to the brain, but often no real cause for the focal damage can be ascertained. Venous thrombosis is very frequently considered and probably occurs more often than we now realize. In most cases it is difficult to prove its former presence. Dr. Evans has collected several interesting cases which seem to show that some children suffer from arterial thrombosis which later produces atrophy and scar formation[2] (Fig. 4).

A few congenital abnormalities are recognized. The septum pellucidum may be absent, or it may be split in two layers, thus producing the so-called fifth ventricle[3] or cavum septum pellucidum. Then there is the cavum vergæ, or sixth ventricle, which is found less frequently; it is situated a little further posteriorly behind and below the fornix. The cavum septum pellucidum and the cavum vergæ are of no clinical significance if they communicate with the ventricles, but when they form cysts they may cause serious intracranial complications by obstructing the flow of cerebrospinal fluid.[4] Agenesis of the corpus callosum presents a diagnostic appearance which once seen is never forgotten.[5, 6] This abnormality is frequently associated with epilepsy. Agenesis of the cerebellum is sometimes encountered. The Arnold-Chiari syndrome usually produces increased intracranial pressure, and in these cases ventriculography is indicated.[7] No doubt many of the diffuse cerebral atrophies, particularly in infancy, are really congenital aplasias. We have seen three members in one family in whom progressive degeneration occurred, apparently due to a familial process.

Now to pass on to ventriculography. In this procedure, gas, preferably oxygen, is introduced directly into the lateral ventricles. It is the method of choice in patients with increased intracranial pressure. In such patients, encephalography may occasionally be justified, but it must be done extremely cautiously as there is a grave danger of sudden death due to herniation of the medulla oblongata into the foramen

magnum. At our clinic we feel that immediate operation should follow ventriculography when the films show evidence of an expanding lesion, and consequently they are seen as soon as they are developed, and when possible a diagnosis is made before they are dry.

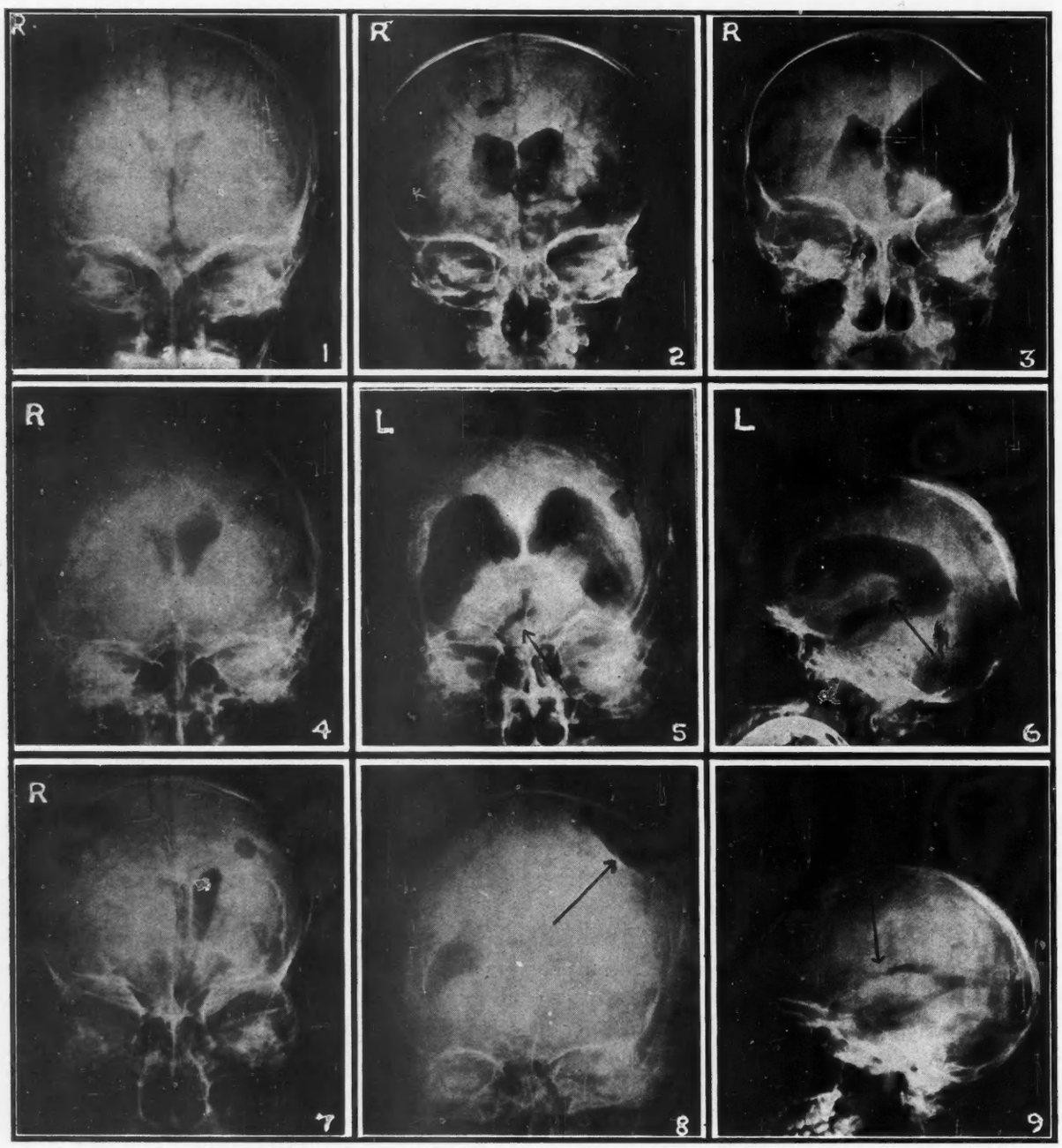


Fig. 1.—Normal encephalogram. Antero-posterior view showing the lateral ventricles, the 3rd ventricle, and normal subarachnoid markings. Age, 3 years. **Fig. 2.**—Post-traumatic atrophy. There is marked enlargement of the lateral ventricles and of the 3rd ventricle. There is also evidence of cortical atrophy, shown by dilated subarachnoid markings over both hemispheres. Age, 5 years. **Fig. 3.**—Unilateral cerebral atrophy. Hardly any of the left cerebral hemisphere remains and the subarachnoid space is obliterated on the left side. The right hemisphere appears relatively normal. Age, 8 years. **Fig. 4.**—Focal cerebral atrophy. The left lateral ventricle is enlarged and there is a porencephalic area in the left hemisphere. The lateral ventricles are displaced toward the lesion. Age, 11 years. **Fig. 5.**—Posterior fossa tumour. The arrow indicates the neoplasm bulging into the 4th ventricle from below. Note the marked internal hydrocephalus involving both lateral ventricles. Age, 13 years. **Fig. 6.**—Pinealoma. It is in the posterior part of the 3rd ventricle. Age, 14 years. **Fig. 7.**—Temporal lobe abscess. The lateral ventricles and the 3rd ventricle are displaced to the left, away from the abscess which is situated in the right temporal lobe. Age, 12 years. **Fig. 8.**—Subdural hæmatoma. The hæmatoma has been drained and filled with gas. The ventricular system is displaced away from it. Age, 15 years. **Fig. 9.**—Intracerebral hæmorrhage. The hæmorrhage is situated in the frontal lobe and is depressing the anterior portion of the lateral ventricle. Age, 14 years.

Several different types of expanding lesions occur in childhood. Tumours are most commonly situated in the posterior fossa (Fig. 5), although they occasionally involve the hemispheres or the pons. It is surprising how often it is possible to demonstrate posterior displacement of the aqueduct of Sylvius and the fourth ventricle in pontine neoplasms. They do not produce complete obstruction until quite late. Such posterior displacement definitely proves the presence of an expanding lesion in the pons, and operation is contraindicated. Other tumours occur in the neighbourhood of the third ventricle (Fig. 6), and these lesions are often extremely difficult to differentiate by clinical examination from posterior fossa lesions. Accurate diagnosis is most important, as the operative approach is entirely different, and well-taken ventriculographic films are invaluable. Arachnitis may simulate a posterior fossa tumour, but the approach is the same and it is not important to differentiate between the two conditions. Abscesses are relatively common, and very frequently they are quite silent until they have attained a huge size. They are prone to occur in the temporal region following infections of the middle ear. These ear infections may be only transitory, and the patient may appear with no sign of active middle-ear disease and yet a large temporal abscess may be present. This is often very difficult to diagnose by clinical methods. Recently a case was admitted with findings that strongly suggested an expanding lesion in the posterior fossa. Ventriculography revealed that there was marked ventricular shift and showed an expanding lesion in the right temporal fossa (Fig. 7). There had been an acute otitis media on the same side three months before, but this had completely resolved. Here, the operative approach was quite different from that originally contemplated. Abscesses sometimes occur in other regions, most notably in the frontal lobe, as a result of infection of the frontal sinuses, or they may be metastatic from such conditions as bronchiectasis, etc.

Various types of hæmorrhage are encountered. Either extradural or subdural hæmorrhage will cause displacement of the ventricular system away from the lesion (Fig. 8). Intracerebral hæmorrhage occasionally occurs, and naturally early operation is indicated (Fig. 9). In most cases it is quite impossible to diagnose between tumour, abscess, or hæmorrhage from the ventriculogram alone, but the previous history will often point to the type of lesion that is present.

In conclusion, the following points should be emphasized.

1. Ventriculography should be used in patients with increased intracranial pressure, and if positive signs are demonstrated immediate operation should be performed by a competent neurosurgeon. Although a rather large number of cases can be diagnosed correctly without ventriculography, there are many patients with misleading findings in whom this form of examination is essential for correct diagnosis.

2. Encephalography is an entirely safe procedure in patients who do not present evidence of increased intracranial pressure. By its use a rather exact anatomical diagnosis can be made and the physician is in a position to make an intelligent prognosis. Suitable treatment can be outlined, either medical or surgical. In patients with evidence of very marked cerebral damage useless therapeutic procedures can be avoided.

It must be stressed that encephalograms and ventriculograms can be intelligently interpreted only in conjunction with the other findings in each individual case.

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CONVALESCENT SERUM IN SCARLET FEVER.—C. R. Hyland and L. R. Anderson state that of 102 children exposed to scarlet fever and given convalescent serum in doses of 10 c.c. for those under 10 years of age and of 20 c.c. for those over 10, only 4 developed the disease, which was mild in 3 and moderately severe in one. In all 4 cases the incubation period was prolonged. Of 47 cases to which convalescent serum was given therapeutically all but one showed improvement. The conclusion was that the percentage incidence of complications, especially adenitis, otitis, and nephritis, increased with each day's delay in the administration of serum.—*Am. J. Dis. Child.*, 1937, p. 504. Abs. in *Brit. M. J.*

SOME OBSERVATIONS ON THE DISAPPEARANCE OF BROMSULPHALEIN DYE FROM THE BLOOD; ITS RELATION TO LIVER FUNCTION

(A PRELIMINARY REPORT)

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OF all the tests yet devised for liver function, it is generally agreed that the bromsulphalein dye retention test is as good as any, and better than the majority. But even this is not entirely satisfactory. That a practical test is necessary cannot be gainsaid. Its usefulness in pre-operative cases, especially those of the upper abdomen and gall bladder, as a means of indicating early and small amounts of liver damage would be enormous. Its value in diagnosis, in prognosis, in known liver disease, and in abnormal pregnancies, would be almost as great.

Any factors which may influence judgment in operating must be given serious consideration. It was with that thought in mind that the following idea was born. This work, using the bromsulphalein dye, was started by the author after a patient died following cholecystectomy, in the hope that with the proper interpretation, gained by sufficient use, it would be able to show early liver damage, and, still more important, liver reserve.

The history of the test as used at present will not be repeated here, other than to say that Rosenthal and Rowntree were the first to show that this dye is excreted solely by the liver. It has been in use for 15 years and is the most satisfactory of the dyes used for this purpose, is non-toxic, and consistently gives abnormal retention in moderate to advanced liver disease. It should not be used if there is clinical jaundice, because of the difficulty of interpretation. Although the present interpretations, *i.e.*, the 30 minute readings, indicate only roughly the extent of parenchymatous damage, the determinations are sufficiently accurate to give valuable information, if repeated. It is hoped that the new technique will afford more accurate information. Five years ago Freiheit showed its usefulness in determining liver damage in the vomiting and toxæmias of pregnancy, and its value in the prognosis of these women.

In a recent discussion of "The use and interpretation of tests for liver function", Snell and Magath say that the bromsulphalein test is perhaps the most generally satisfactory of any yet devised for estimating hepatic function. This statement is based on over 10,000 tests at the Mayo Clinic, as compared with all other tests. It must therefore carry some weight, especially when Magath has shown that a retention of the dye occurred in 96 per cent of cases in which there was evidence of parenchymal hepatic injury.

Eusterman, commenting on some German liver function tests in the 1934 Year Book says, "As a matter of convenience and dispatch, as well as because of trustworthiness, our liver function tests are largely confined to the van den Bergh in jaundiced patients, and the Rosenthal bromsulphalein test in non-icteric patients. Frequently the galactose tolerance test of Bauer is used, but his procedure has its shortcomings under certain circumstances, as Snell has pointed out."

Because this dye, after injection into the circulation, is completely taken out of the blood at the end of thirty minutes in apparently normal people, it is at present considered that any person who at the end of this half hour has no dye, or only a trace, left in the blood has a normal functioning liver. It is with this that the writer disagrees, because if this is true, it must be admitted, indeed it is the same as saying, that any two livers which have no dye in the blood at the end of 30 minutes, but one of which did the work in 10 minutes, and the other just managed to do it in 29 minutes, are functionally the same, and have the same reserve. But this is not reasonable, nor is it true. An abnormal liver with its tremendous reserve power can do, if given time, the same that a normal liver can do. Now the defect of the test as used at present is this: a normal result does not indicate an absence of liver damage because of this great reserve, although an abnormal retention means almost definitely a diseased liver. In other words, disease must have advanced to some degree before the test is abnormal, *i.e.*, before it gives a retention at the 30 minute mark, so that early, or small amounts, or potential disease is passed over, and the pathological liver is considered as normal. This is worse than no test at all.

Two autos may drive from Chicago to New York in 30 hours, but that does not say that one is as good as the other. The first may be chugging along at full speed all the time, using every bit of its available power, while the second, with plenty of reserve, could if necessary do it in much less time. And so with two livers which empty the blood of dye in 30 minutes. One may be working at full capacity all the time and just able to do it and no more,

while the other does it in half the time with plenty to spare, but the result at the end of 30 minutes is the same and the interpretation has been the same. But this will immediately be proved to be wrong. Allow me one more example. Take two kidneys both able to excrete 80 per cent of the phenolsulphonephthalein dye in two hours. "A" does it by putting out 10 per cent every 15 minutes, working to its utmost; "B" does it by putting out 35 per cent in the first 15 minutes, 20 per cent in the second, 10 per cent in the third and 10 per cent in the fourth, with 75 per cent out in 1 hour. Which of these two kidneys is the better in actual working ability at the moment, and in reserve force? The second, of course. That principle applies to the liver in this way. If the rate at which the liver takes dye out of the blood can be determined, and a graph plotted, it should be possible to produce a curve that would always be relatively the same for a normal organ (with variations, of course within normal limits). This has been done by estimating the remaining dye in the blood at two-minute intervals, by means of a simple three-way valve on a needle remaining in the vein, so that one puncture only is necessary. The curve is plotted with the percentage retention of dye as vertical ordinates and the two-minute intervals as horizontal ordinates.

A remarkably constant curve has been obtained for normal livers in such cases as fractures, fibroma of leg, anxiety neurosis, dysmenorrhœas, amenorrhœas, varicocele, duodenal ulcer, gastric ulcer, etc. But the result most noteworthy is this: all curves that fall to 0 per cent retention within the 30 minutes do not do so by having a decreased retention at each interval. This is shown in Fig. 1. At the 8, 10, 12, 14, 16 minute intervals the retention remains at 15 per cent, *i.e.*, for 8 minutes that liver could not take out one bit of dye. It had apparently reached, for a time, its maximal capacity for work. The same result is shown in Fig. 2. May not this liver be the type that will cause the so-called liver death in an apparently good risk patient? Indeed may it not be the cause of death in many unexplained cases? (It has been suggested that the liver is the cause of death in the thyroid storm). It cannot be argued that this liver, or the ones in Fig. 2 (graphs 26 and 27), are able to work as thoroughly, or efficiently as the livers in Fig. 3 (graphs 2, 16 and 21), which are representative of the so-called normals. Is this because of an actual lesion, or temporarily changed function which may become pathological? It seems, at this time, to be the latter. And if a liver cannot do this easy job well it is reasonable to assume that after operation, when the strain on it and the work it has to do are for the time being greater, it might fail completely. If this theory is tenable it will present an available means of determining an approximate idea of the efficiency of the function of any liver, and, it is hoped, will show which liver will have the greater chance of failing when any extra work is forced on it.

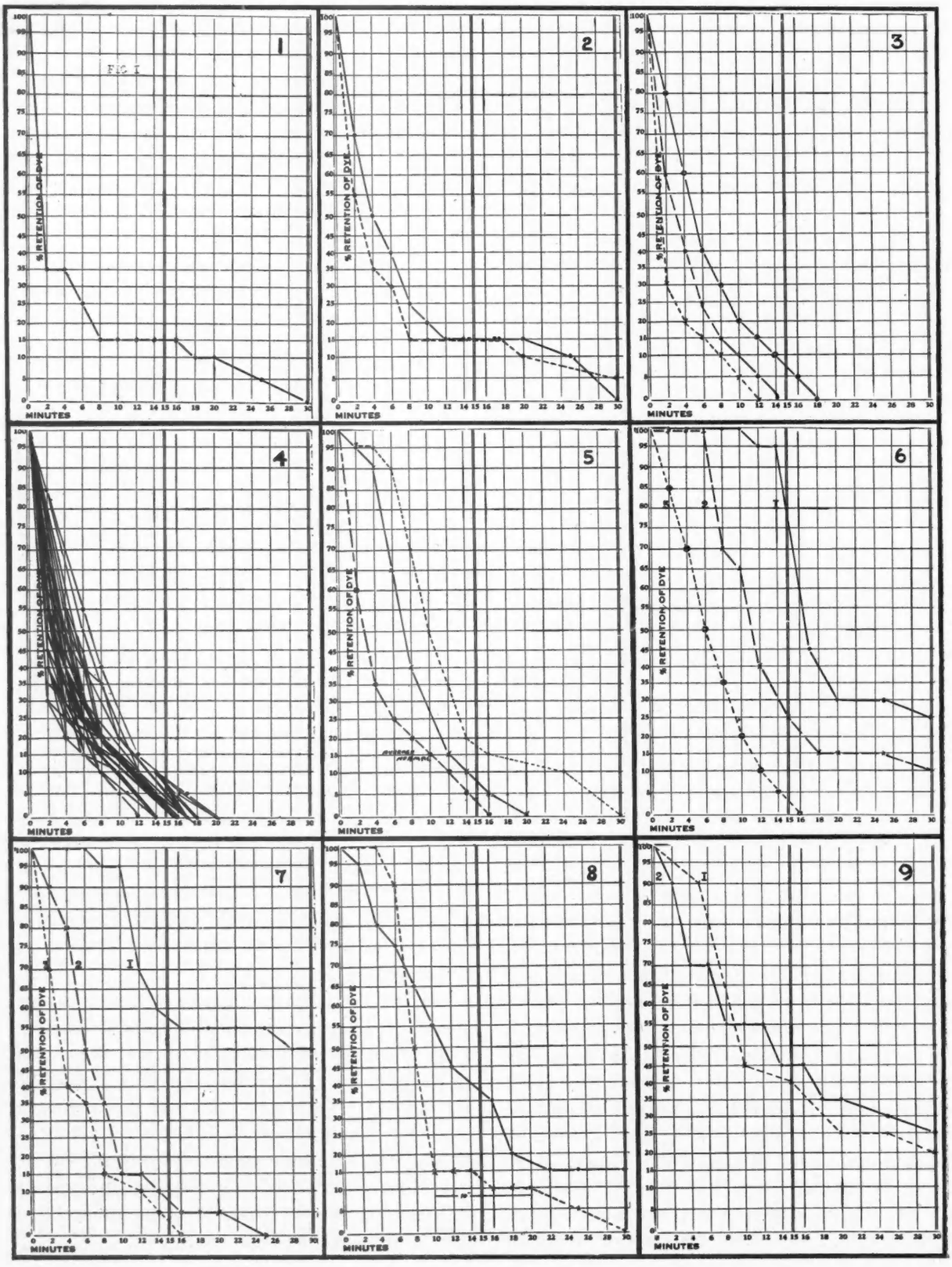
SUGGESTIONS FOR INTERPRETATIONS OF THE GRAPHS

Figs. 1 and 2, as compared with Fig. 3, show the abnormal in the first 2 and the normal in the third. There is some reason why these livers work so differently, and why one is able to constantly take dye from the blood and another has to hesitate, and "catch its second wind", like a runner, before going on. May it not be compared to angina, where a heart can do a little work for a while, and then must stop for a few minutes' rest before continuing, apparently strong again?

The suggestion is made that of these six livers, which by the present reading of the test have 0 per cent retention at 30 minutes, and are because of this called normal, that the three in Fig. 3 are more functionally perfect than their fellows in Figs. 1 and 2. And it therefore follows that all tests which show no retention at 30 minutes are not indicative of normal livers. This is more clearly shown in Fig. 5. Note in Fig. 3 how the disappearance of the dye, when plotted, produces almost a straight line. This is a common finding in many graphs.

Fig. 4.—Twenty-five normals, all superimposed. It is seen that none of them show over 10 per cent retention at 14 minutes; none over 15 per cent at 12 minutes, and only 2 over 20 per cent at 10 minutes. All but three show 0 per cent retention at or before 18 minutes, thereby establishing a relatively constant curve. It will be noted, too, that the dye disappears with no hesitancy. There is a continuous and even disappearance from the blood.

Fig. 5.—An average normal shown with 2 curves from two different cases of carcinoma of the pylorus. The continuous line represents recovery after a gastro-enterostomy, and the broken line, death. The latter was admittedly the poorer risk, and the chart shows 50 per cent retention at 10 minutes, as compared with 15 per cent on the normal. The interesting point is that even this was all out at the 30 minute mark. The comparison of the three is impor-



tant because they all show a normal response as interpreted heretofore, but the ability of the livers to function is obviously different. At 8 minutes the straight line has taken out 30 per cent more dye; at 10 minutes, over 20 per cent more; and at 12 minutes, 20 per cent more than the interrupted line. The straight line also finishes within the normal limits, and shows that all the dye has been taken out 10 minutes earlier than in the fatal case. It is suggested that this graph tells more about the functions of the liver than the present test, in which they would have been considered to have equal ability and be normal.

Fig. 6.—Graphs 1, 2 and 3 are all from the same person, a physician, aged 67. Graph 1 was made on the first day in the hospital. The patient had lost 53 pounds in weight in 6 months by vomiting and was completely dehydrated. He was persuaded that his pyloric obstruction was caused by a cicatrized duodenal ulcer and not a carcinoma (which was true), and he was prepared for gastro-enterostomy. Graph 2 shows the change in his liver function after 10,000 c.c. of 2.5 per cent glucose had been given to him over a period of 4 days. Graph 3 was made 2 weeks after operation and shows a liver functioning much better than in the first two. Certainly these comparisons show the value of the graphic chart, particularly to those who say that one hour is the time limit for finding 0 per cent retention. It is suggested that this also shows the reserve of the organ. The first graph is that of a liver "all tired out", and the third graph shows the same liver, rested and able to work. Is this not comparable to a man also "all tired out" who can do little heavy work, but who can after food and rest do as much as ever? Both have reserve, as compared with the irreparable damage shown in Fig. 9.

Fig. 7.—Mrs. F., aged 39. Graph 1 was made 24 hours after a salpingectomy when she seemed to "go bad". Graph 2 was done 48 hours after, when her condition was good and after having 5,000 c.c. of 2.5 per cent glucose. Graph 3 was made 12 days later and is normal. Although 2 and 3 appear the same it will be seen that at 4 minutes No. 3 has removed 60 per cent, and No. 2 has removed only 20 per cent, *i.e.*, at 4 minutes No. 3 has removed 40 per cent more dye, but both are well within the 30 minute limit.

Fig. 8.—Mrs. J., aged 41. Chronic cholecystitis of 15 years' standing. Stones were removed twice, and the bladder was said each time not to have been removable. She developed an acute empyema following an attack of colic which came during the preparation for a cholecystectomy. Graph 1 was made just prior to the operation for the empyema; graph 2 was made 2 weeks later. The high curve in No. 2 is likely explained by the fact that the dye was injected through the same needle that the blood was drawn out of and is for this reason not dependable. But the last part of the curve is more normal. This will be interesting to follow, as the woman is still under observation.

This, it is suggested, also shows "reserve". When the toxic substance had been removed and the temperature and pulse became normal the liver was able to function more normally, but not completely normally yet. This is now considered a sign of "early disease", as contrasted with reserve. The livers still can not, after rest and food (glucose), do as good a job as those in Fig. 3—nor has it approached the normal curve as closely as the last graph in Fig. 7. The No. 1 in Fig. 7 is worse than No. 1 in Fig. 8, but it has the latent ability to do all it is asked to do, and it does—as shown by the constant disappearance of the dye in No. 3; whereas Fig. 8 (No. 2) takes out only 5 per cent in a 10 minute period, and takes 30 minutes to do it all—twice as long.

Fig. 9.—Mrs. S., aged 82. Graph 1 was taken 36 hours before death from uræmia; chart 2 was taken 6 hours before death. No jaundice; icteric index 4. This shows liver damage that cannot be repaired. Rest and food made no difference to its ability to work.

COMMENTS

The follow-up of this work will try to show that the appearance of abnormal amounts of urobilin in the urine, and the increase of bilirubin in the blood, although excellent tests of early liver dysfunction, are not so early or so delicate as the above. This work is not complete and shows only 60 cases, because it had to be done on private patients, as no ward work was available. It is an office procedure, where all but eleven of the patients were tested, and is not inconvenient to the patient or the office. The thoughts suggested are far from conclusive, but it is believed that they are worthy of more carefully supervised work, which is being done at present.

It is hoped that this future work will also show more conclusively the reserve, as compared with liver damage, and as has been suggested in several graphs.

TECHNIQUE

An intravenous needle of short bevel and 18 or 20 gauge is introduced into a suitable vein, as for a Wassermann test, the syringe withdrawn, and a three-way Luer valve attached to the needle in the vein. To this valve is connected a tube leading from a flask of saline or citrate solution which can, by the valve, be directed into the vein, or out through the opening which holds the syringe. The handle in the third position allows direct suction through the needle and valve to the syringe, into which the blood is sucked, the syringe detached, and the fluid directed through, first, the open end, which will prevent clotting in this portion, and then continued into the vein for the two minute period. This prevents clotting in the needle. When it is determined that the fluid is dripping at the proper rate in the vacuum tube and the valve is working properly, 2 mg. of bromsulphalein per kilo of body weight are injected slowly (1 minute) into another vein, and the first specimen of blood drawn off in exactly two minutes. This is deposited in a clean dry test tube, allowed to clot, and, with the other specimens, centrifuged, and the clear straw-coloured serum examined to determine the percentage retention of dye in that particular specimen. It is suggested that the estimations be not in numerical order, as this unconsciously tends to determine the next value. Some such order as this: 17 minutes, 4 minutes, 20 minutes, 2 minutes, 10 minutes, 14 minutes, 6 minutes, etc., should be used. These points are then plotted on the graph and joined, to produce the curve. Thus it is clearly and distinctly seen how fast, and evenly or unevenly, the liver absorbs the dye, and how it compares with the normal curve. From this you judge the relative ability of this organ to function 100 per cent.

Since this preliminary report was prepared many graphs have been made, but there are two of real interest. They both show definite retention for 8 and 12 minutes at the same level and resemble Figs. 1 and 2. The first is out at 26 minutes, and the other at 30 minutes. They had been expected to be normal and no reason could be found for their abnormality, until it was seen that one had a basal metabolic rate of –18, and the other, –11. Could it be that because of the generally lowered metabolism of the whole body, as must be the case with their low reading, that the liver also is working a little slower than it otherwise would? There was no increase in urobilin in the urine, nor of bilirubin in the blood.

Acknowledgment is made to Dr. W. J. Macdonald of St. Catharines for the privilege of using cases which are illustrated in Figs. 5 and 6.

SQUINT*

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THE eyes during sleep, deep anæsthesia, and in death are in the anatomical position of rest, and the visual axes are divergent. If one looks at an object at a distance of twenty feet or more the visual axes are parallel and the eyes are in the functional position of rest. Then, looking at a near object, three associated movements occur which are controlled by the third nerve. These are: (1) contraction of the pupils; (2) the accommodation comes into play so as to focus the rays coming from the near object sharply upon the macula; (3) the eyes converge to bring the visual axes toward the object now viewed.

In squint the visual axis of only one eye is directed to the object looked at. This is the fixing eye; the other is the squinting eye. The first thing to decide about any squint is whether it is paralytic or non-paralytic. To do this, have the patient look straight ahead. This is the position of rest of all the ocular muscles in one with normal vision. You may see nothing abnormal. Now ask the patient to follow your finger with his eyes as you carry it through the six diagnostic directions of gaze. These are right, left, up and right, up and left, down and right and down and left. Normally, one eye follows the movements of the other equally in all directions. But, let us suppose the patient has a paralysis of the left external rectus muscle. Movement of the left eye to the left will either not occur or be very slight. This lagging behind the other eye causes an annoying diplopia. The squint shows up in the field of action of the

* A paper read on December 17, 1937, at Harper Hospital, Detroit, Mich.

paralyzed muscle. The recognition of the non-paralytic form of squint is not denied even to the man on the street. When the patient looks straight forward one eye is straight while the other may be turned either toward the nose or the temple in the average case. Occasionally it may be turned upward or downward, or combinations may exist. The visual axes are usually convergent or divergent. If you ask the patient to look in the six diagnostic directions of gaze the squinting eye is seen to follow the fixing eye in all movements according to a fixed relationship; the angle of deviation of the visual axis of the squinting eye from parallel is kept up all the while. In other words the visual axes are not parallel when the eyes are directed straight ahead or in any other direction. For this reason non-paralytic squint is generally called "concomitant squint" from the Latin *concomito,* I accompany. May I repeat that in paralytic squint a persistent diplopia troubles the patient. By the time a concomitant squint comes under observation the initial double vision has ceased to annoy the patient. He has learned to suppress the false image of the squinting eye.

Concomitant squint nearly always begins in infancy and childhood. The prognosis is good if prompt and proper treatment is given. With delayed or inadequate care the little patient has a slight chance of having two normally functioning eyes. A child with crossed eyes may be ridiculed by his playmates and the effect on his personality may be very bad. I quote from Bacon's essay on Deformity.[1] "Whosoever hath anything fixed in his person that doth induce contempt hath also a perpetual spur in himself to rescue and deliver himself from scorn; therefore all deformed persons are extreme bold; first, as in their own defence, as being exposed to scorn, but in process of time by a general habit. Also it stirreth in them industry, and especially of this kind, to watch and observe the weakness of others, that they may have somewhat to repay."

There are two kinds of concomitant squint: (1) monocular, in which one eye constantly fixes on the object viewed and the other turns usually in or out; if toward the nose it is convergent, and if toward the temple, divergent; (2) alternating, in which first one eye and then the other fixes. For example, in looking at a distance the right eye may fix and the left squint. On looking at a near object the process may be reversed, that is, the left eye may fix and the right, squint.

The question as to the actual cause of squint still awaits the final answer. McMullen writes,[2] "The etiology of concomitant squint is as yet unsolved. We have hypotheses in plenty but none that gives a completely satisfactory explanation of the development of the squint." Parents often blame some illness, such as measles or whooping-cough, or even a shock for the onset of the squint. To some extent they are correct. Such an event may suffice to upset a poor ocular muscle balance and precipitate a latent squint.

Let us consider first what is good muscle balance, what may upset it, and what consequences are to be expected from the upset. The visual axes of a child looking into the distance are normally parallel. On looking at a near object they converge. All the while the child sees with both eyes, and the two retinal images are blended into one in the visual cortex. The desire for clear binocular vision and not simply muscle tone is what keeps the eyes "straight". Normal muscle balance (orthophoria) and binocular vision are not possible without an adequate sense of fusion. Fusion is the ability to combine the two retinal images into a single visual impression. As yet no fusion centre has been demonstrated. Congenital blindness of one eye and congenital cataract prevent binocular vision and so interfere with the normal development of fusion. Squint may occur in such cases. Let us trace the development of this mysterious faculty in the baby.

Light and darkness perception are probably present soon after birth. The baby then develops true vision. At first there is double vision (diplopia). Later, simultaneous macular perception is achieved. The image of the object viewed is received on each macula and the corresponding parts of the retina at the same time. Then come binocular vision and fusion. The fusion faculty begins to develop about the sixth month, is well advanced by the twelfth month, and is usually complete by the sixth year. It develops slowly in the same way as talking and walking. A child may have a perfect sense of fusion, a partially developed one, or none at all. Finally, stereopsis develops, giving perception of depth or a sense of the third dimension. This is of great value in everyday life. The

baby helps himself to develop stereopsis by feeling with his hands, when possible, whatever he looks at.

Even with perfect fusion the muscle balance may become upset. This upset occurs more easily of course if the fusion sense is imperfect. Long-sightedness (hyperopia), with or without hyperopic astigmatism, is the usual disturbing factor leading to the appearance of a convergent squint. It is almost the rule for this refractive error to be further complicated by unequal refraction in the two eyes (anisometropia). Ordinarily, short-sightedness (myopia) upsets the muscle balance also, and if it does so will usually usher in a divergent squint. Nearly every child is hyperopic at birth. The full length of the normal eye giving normal vision (emmetropia) is not usually attained until the seventh year. Failure to reach the normal length allows the hyperopia to continue. If the normal length is exceeded myopia appears. A myopic eye is generally a sick eye.

Let us consider how a refractive error may cause a muscular imbalance which may pass into a squint. Since hyperopia is so common in early childhood why does convergent squint not develop more often? Accommodation and convergence are only to a small extent independent of each other. An emmetrope must accommodate and converge for near vision. A hyperope accommodates for near vision the same amount as an emmetrope, plus the amount of accommodation required to compensate for the hyperopia. The extra accommodation brings on an added and often undesired divergence. The visual axes may then actually meet at a point nearer to the eyes than the point accommodated for. The result is a distressing confusion of images to the patient. The excessive convergence causes in time a tendency for the eyes to turn in (esophoria). This may be followed by a deficiency in convergence power. Sherrington has shown that excessive stimulation of the centre for one movement leads to inhibition of the centre for the opposing movement. This may lead to permanent structural changes in the opposing groups of muscles. A frequent complicating factor is anisometropia, already mentioned. This renders the sight of one eye worse than that of the other. In such a case the image of the worse eye confuses that of its fellow instead of reinforcing it. If the little patient wishes to see clearly he must make too strong an effort of accommodation, but he can only do this by putting forth an excessive convergence, so that he sees double. Again, if he converges only so much as is necessary he cannot bring the proper amount of accommodation into play, and so he sees indistinctly. He has the choice of seeing distinctly and double or seeing single and indistinctly. He is on the horns of a dilemma.

An exhausting disease such as whooping-cough, a fright, or shock may suffice at this time to upset an already unstable muscle balance and precipitate a squint. This occasionally happens even when there is a good sense of fusion. Worth[3] found that heredity plays a big part in squint. There was a family history of squint in 50 per cent of his cases. A hyperopia complicated by anisometropia is usually responsible for convergent squint. If however the hyperopia is the same in both eyes the squint is apt to be of the alternating type mentioned above. The development of the squint gives to the patient a welcome feeling of comfort, and he thinks he has found a way out of his difficulty. There is clear vision with one eye, and the blurred image of the other eye is suppressed. Suppression is a mental faculty which is poorly understood, but which enables the patient to escape the annoyance of diplopia and achieve a measure of comfort in the act of vision. Herein lies the tragedy of squint. Suppression of the vision of the squinting eye leads to amblyopia *ex anopsia* (a true loss of vision from disuse). It affects only the central region of the retina and causes no contraction of the peripheral field of vision. In an extreme case of acquired blindness from disuse there is often a scotoma which may extend 15 to 20 degrees in all directions around the centre of the field of vision. In this area of scotoma there may be bare perception of light; outside, fingers may be counted a foot or two from the face. Amblyopia *ex anopsia* does not occur in alternating squint. The reason is that there is no disuse, because now one eye, then the other, is used. The convergent form of squint is perhaps ten times more common than the divergent form, which, unlike the former, generally appears in children of early school age who are myopic. The consequent amblyopia from disuse is for this reason never so pronounced as in convergent squint, which, according to Fuchs,[4]

usually appears between the first and fourth years. The act of accommodation is closely linked with that of convergence. A myope uses little or no accommodation for near vision, therefore convergence suffers a like disuse. When the power of convergence fails divergence asserts itself unduly. The result is a muscular imbalance with a tendency of the visual axes to deviate outwards (exophoria). When a muscular imbalance of whatever sort is present there is always danger of its precipitation into a frank squint. Many factors, some little understood, are operative in the production of squint. There is little doubt that the eye muscles, in common with the general musculature, share in the bodily reaction in the course of an acute illness of childhood. If the little patient has been allowed to read or look at small objects during such an illness, or too soon after, the muscle balance, which has been rendered rather precarious by the illness, may be upset. The tendency to squint becomes the actual squint. At first it may be seen occasionally, as when the child is tired; later it becomes constant.

Let us suppose that in a given case of myopia there has been no debilitating illness. The child starts school and soon finds that from its allotted seat the blackboard cannot be seen clearly. Frequently about all that is done in such a case is to assign a front seat. Under these conditions the myopia tends to increase steadily. In a few years the book may have to be held so close to the eyes that it is hard to converge enough and hold that convergence for very long. All distant objects are blurred and misty. Failure of convergence causes imperfect binocular vision, and, so, the words "run into one another" is the frequent complaint. About this time the child discovers that if he holds his head a little to one side that he has clear effortless vision. He is probably unaware that this vision is accomplished with one eye. There may in this position be no convergence at all. Later a measure of divergence creeps in, so that while one eye engages the book the other is divergent and looks into misty space. When the child looks up from the book the divergent eye at first recovers itself. After a time however it remains divergent for near vision. Ultimately the habit is fixed, and the eye is divergent even for distant vision, so that the squint is present all the time.

From the standpoint of pathology there is little to be said. Many cases of convergent squint show at operation hypertrophy and shortening of the internal recti and atrophy and lengthening of the opposing external recti. The reverse may be seen in the case of divergent squint. The amblyopic eye usually appears normal on fundoscopic examination. Squint is therefore a clinical condition differing in character and importance in different cases, and due to many causes.

Let us consider a few simple clinical tests. These are intended to differentiate normal muscle balance (orthophoria), muscular imbalance (heterophoria), and squint (heterotropia). With the patient looking straight ahead the observer covers and uncovers one eye and then the other. As he does so he looks for movement and, if none is detected in either eye, the muscle balance is said to be normal. Now to distinguish between a 'phoria and a squint. If it is a 'phoria the eyes will likely appear straight. The patient looks directly ahead. You cover one eye and as you do so a movement in, out, up or down, occurs under cover. As you uncover the eye is seen to swing back to its original position. Meanwhile you detect no movement in the other eye. The same thing happens when you cover and uncover the other eye. If a squint exists the chances are that you will see it. With the patient looking straight ahead the observer covers and uncovers the squinting eye and no movement is detected in either eye. But, when the fixing eye is covered and uncovered both eyes are seen to move.

Treatment should begin as soon as the diagnosis is made. One may atropinize the fixing eye in order to make the squinting eye work. A drop of atropine sulphate, ½ per cent, instilled daily into the "straight" eye will blur its sight enough to make the patient use the other eye. If this does not straighten the squinting eye in a few weeks the atropine treatment should be stopped. In prolonged usage of atropine the straight eye may become amblyopic. For this reason occlusion of the better eye by padding should be done early in the treatment. There is no way of improving the amblyopia of the squinting eye unless you make it work. There is no way of making it work unless you cover the other eye adequately. The adhesive is run on the pad from the nasal side of the straight eye to the temporal side of the squinting eye. This is to avoid cheating by peeking from the

corners of the pad. This cover does not hurt the eye. Let us suppose the pad is applied on Wednesday. It may then be taken off on Sunday, the face washed, and the pad re-applied, to remain on until the following Wednesday. After a few months of occlusion the child will be about a year old if the squint started at six months, which is not unusual. Any physician may, if he will, apply the treatment so far outlined. All too often physicians do little more than assure the parents that the baby will "grow out of the squint". Such men are unworthy of their trust and show gross lack of knowledge. The so-called cure which is often seen at puberty is a cosmetic cure only. In the growth of the face the orbits become more divergent. As a result the internal recti work less easily than before. The vision of one eye remains permanently impaired.

It is usually possible to do a fair refraction at one year. Certainly glasses may be worn at fourteen months. Usually a child who needs glasses gets them at two years. A great deal depends on the intelligence and cooperation of the parents. In many cases the constant wear of correcting lenses will straighten the eyes. If a tendency to squint returns, or if straightening has not occurred, padding of one eye with the glasses on may be tried. At least six months of padding, followed by another six months of wearing glasses, is usually indicated. Then possibly another six months of combined glasses and padding should be tried. If the child is now three or more years old, and still is in need of treatment, some form of orthoptic training may be undertaken. However certain conditions should obtain if benefit is to follow orthoptic training. The patient should be at least four years old and of not less than average mentality. The vision of the squinting eye must have been brought up as much as possible by atropinizing or padding the better eye. Finally, there ought to be an accurate retinoscopy under atropine cycloplegia. In prescribing glasses it is usual to deduct 0.50 dioptre from this finding. Some cases will take the full correction. If improvement has not resulted from six months of orthoptic training operation may be safely advised.

A definite age cannot be designated for operation, because one child may begin to squint at six months and another at three years. One should not promise that after the operation the eyes will be straight. The possible necessity of further operation for over- or under-correction should be mentioned. Even if the eyes are straight after the operation the refractive error which was a factor in the development of the squint is still present, and therefore glasses must still be worn. Unless the correction is worn the squint may reappear. Penman[5] gives a few psychological factors which help one to decide on the proper time for operation.

"Some children are very sensitive about their squint; others do not seem to mind in the least. Small boys who are teased a great deal by their schoolfellows are often very unhappy for this reason, and in such cases operation should be performed as soon as possible, even if there is some chance of the eyes becoming straight after prolonged treatment. I regard this as a most important point, and think that in every case careful inquiries should be made (but not from the child) as to how much it worries about the squint."

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PLEURAL EXUDATE FOLLOWING ARTIFICIAL PNEUMOTHORAX.—B. Papanikolau states that pleural exudate is present in 60 per cent of cases of artificial pneumothorax and is its most common complication. It is more often seen in incomplete pneumothorax, following fatigue, after infection of the respiratory passages, or where the patient's living conditions are unhygienic. It is rare for a pleural exudate to occur a year or more after the production of an artificial pneumothorax. The exudate is always tuberculous in origin. There is a definite relationship between the clinical manifestations and the manometric pressure; when the latter is positive the symptoms are acute, but as the pressure becomes negative they lessen in intensity. A pleural exudate may have a bad influence on the general condition of the patient; it may give rise to adhesions between the pulmonary and costal surfaces of the pleura; secondary infection of the exudate may threaten the life of the patient; and the efficiency of the lung may be seriously impaired. In the acute stage the exudate should under no circumstances be removed. The production of a negative pressure improves the clinical manifestations rapidly. If secondary infection occurs endopleural wash-outs and surgical measures are indicated.—*Z. Tuberk.*, 1937, **78**: 1-2, 7. Abs. in *Brit. M. J.*

THE ETIOLOGY OF CHOREA: ITS RELATION TO RHEUMATIC FEVER AND HEART DISEASE*

(AN ANALYSIS OF 105 CASES)

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IN recent years some question has been raised as to the clearcut relationship between Sydenham's chorea and rheumatic infection. In the absence of a specific etiological agent for rheumatic fever the relationship has been studied from the point of view of the onset, course, and sequelæ observed in both conditions. Since cardiac involvement is by far the most common feature and the typical sequel of rheumatic fever, the incidence of this occurrence has been studied in chorea and correlated with similar findings in rheumatic infection. On this point the literature presents divergent and confusing views. Most authors state definitely that it is safe to consider chorea as a part of the rheumatic syndrome. The original suggestion of a possible relationship between chorea and rheumatic fever goes back to the beginning of the nineteenth century. It was specifically mentioned by Bouteille,[1] a French general practitioner, in 1810, who proposed the name "rheumatic chorea". Since that time this causal relationship has grown almost into a tradition. Concerning the exact rôle, however, which chorea plays as a manifestation of rheumatic fever there has been no general agreement. The purpose of this paper is two-fold: (1) to analyze the incidence of heart disease in a group of children presenting a history of one or more attacks of chorea uncomplicated by any other rheumatic manifestations (pure chorea); (2) to compare this incidence with the incidence of heart disease in a group of children presenting histories of chorea, plus other manifestations of rheumatism (mixed chorea).

An extensive monograph on chorea was written by Osler[2] who found a high incidence of endocarditis. On analyzing his data Jones and Bland[3] found that rheumatic fever and not chorea seemed to be the important factor and this would explain the high incidence of heart disease. Osler, however, recognized the fact, even at that time, that there were certain observers, particularly the German school, who doubted the relationship between chorea and rheumatic fever. Since that time a number of investigators have quoted a high incidence of heart disease in chorea, but made no attempt to separate pure chorea from that associated with other rheumatic manifestations. Some of these are Thayer,[4] who, in a study of 808 cases of chorea, stated that the incidence of heart disease was 27.7 per cent; Frazer[5] found an incidence of 63 per cent; Abt and Levinson,[6] 36 per cent; Koplik,[7] 72 per cent; Strong,[8] reported 42 per cent in those having the first attack of chorea and 52 per cent in those with repeated attacks. Coombs[9] found rheumatic heart disease in 44 per cent of patients with chorea. He stated that chorea usually occurs in cases of the milder grades of rheumatic infection. Findlay[10] stated that arthritis is a greater potential danger to the heart than is chorea, 75 per cent as against 59 per cent.

It is only within the last three years that an attempt has been made to separate the so-called pure group of choreas and the mixed group, in order to evaluate the cardiac complications which follow. In Schwartz and Leader's[11] follow-up of 75 cases of pure chorea the heart was found to be ultimately involved in the majority. Gerstley and his associates[12] reported a study of 150 children with chorea, and concluded that observation of these children over a period of years demonstrated that endocarditis is by no means an invariable complication of chorea, but almost exclusively a sequel of true rheumatic and tonsillar infection. As a result of their investigations chorea is defined as "a clinical syndrome rather than a disease entity developing in a child predisposed to it by heredity and constitution, upon exposure to exhausting psychic stimulation or various infectious factors." They also state that psychic trauma seemed a far more important factor in its etiology than any type of infection. Jones

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and Bland,[3] in the largest survey to date, reported a comparative study of 482 patients with chorea and 518 with rheumatic manifestations other than chorea, followed for an average period of eight years from the time of onset of the disease; 28 per cent were pure choreas and 72 per cent mixed choreas. They found that the incidence of heart disease in patients with pure chorea was 3 per cent as compared with 73 per cent in children who had chorea and other manifestations of rheumatic fever. They regard chorea by itself as a relatively benign complaint, and state that the special liability to heart disease only arises when some other manifestation of rheumatism has also been present. Parrish and his associates[13] analyzed 112 children with a history of chorea for a period of three years. The incidence of cardiac involvement in the pure chorea group was 52 per cent, in the mixed group 76 per cent. Coburn and Moore,[14] analyzing 251 cases of chorea, concluded that one-half the cases occurred in non-rheumatic subjects, one-fourth in quiescent rheumatic subjects, and the remaining fourth during active rheumatism. They state that "chorea *per se* does not suffice for the recognition of the rheumatic subject nor for the diagnosis of rheumatic activity". Sutton and Dodge,[15] however, in a very recent analysis of 467 cases of chorea found that about 20 per cent of the pure choreas developed heart disease. They feel that emotional factors are not of much importance in initiating chorea, and regard chorea as a major manifestation of rheumatic infection.

Source of Material and Methods

Our cases were collected during the past three years from the admissions to the Rheumatism Pavilion of the Children's Memorial Hospital, Montreal. These children were almost equally of French and English extraction and belonged to the poorer class of the community. Each child had a careful physical examination and the routine laboratory procedures, which also included an erythrocyte sedimentation rate, done twice a month, and a teleroentgenogram taken on admission and discharge. A fluoroscopic examination of the heart in various positions was always made, and if there was evidence of heart disease as shown by cardiac enlargement, an œsophagram was done. This was particularly valuable in cases with suspected mitral stenosis where a posterior displacement of the œsophagus was diagnostic.

Our cases fell into two main groups (1) children who presented a history of one or more attacks of uncomplicated chorea — "pure chorea"; (2) children who presented a history of chorea but who also had a history of other rheumatic manifestations, such as repeated upper respiratory infections and infected tonsils, joint pains, nodules, or heart disease—"mixed chorea".

Our criteria for heart disease were as follows: (1) definite heart disease—cases presenting definite valvular murmurs and cardiac enlargement by roentgen studies; (2) possible heart disease—cases presenting doubtful murmurs and questionable or no cardiac enlargement; (3) no heart disease.

Analysis of Data

Of the total group of 105 cases 41 were boys and 64 girls. The ages varied between 2½ and 14 years, the maximum numbers being in the group between 6 and 12 years inclusive, with a sharp rise at 6 years and a sharp drop at puberty. All the children belonged to the poorer class of the community, only a small proportion, however, being destitute. Sixty-six cases were classed as mild, 27 as moderate, and 12 as severe. Our treatment consisted of rest in bed with no attempt made at isolation. On admission, 15 grains of calcium gluconate and 5 grains of aspirin were given three times a day. This was continued until all active evidences of chorea had disappeared, usually in three to four weeks. We found that the calcium acted as a distinct sedative and that the aspirin seemed to enhance its action. Warner[16] showed that the calcium content of the cerebrospinal fluid in active chorea is consistently low and the phosphate value is increased. As recovery takes place there is a rise in the calcium of the spinal fluid and a fall in the phosphate values. He obtained good results with the use of parathormone and soluble calcium salts. Pearson,[17] in a study of 23 of our cases of active chorea, could not confirm Warner's findings. She felt that treatment with calcium and aspirin was purely symptomatic. A few of our patients received typhoid vaccine intravenously, and in several others the inductotherm was used. It was felt that these measures were too drastic and that they by no means prevented recurrences.

One hundred and five children were discharged as improved after an average stay of three months. In most cases the symptoms had

disappeared within a month's time, the remainder of the hospital stay being occupied in removing foci of infection. Of the total number of children studied 56 presented a history of chorea without rheumatic manifestations and 49 were mixed cases. Seventy children were studied during the first attack of chorea and 35 with a history of previous attacks, one child giving a history of four attacks of pure chorea with no heart disease.

Following the clinical criteria for heart disease outlined above, we found that among the 56 children with pure chorea there were 15, or 27 per cent, who showed heart involvement, mostly slight. If we analyze this group further we find that 7 of them had infected tonsils which were removed while on the ward, and they gave a history of frequent upper respiratory infections and sore throats. This leaves 8 cases of pure chorea with heart involvement, or 14 per cent (see Chart). The heart disease was present

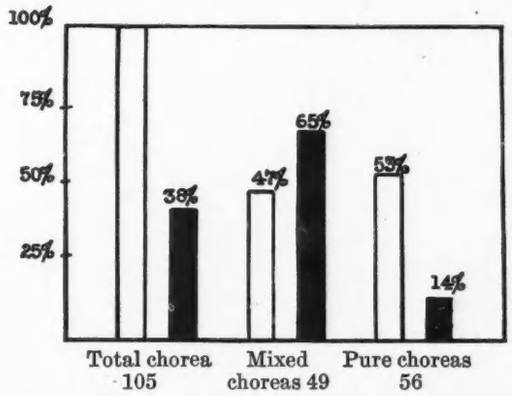


Fig. 1.—Incidence of rheumatic heart disease following chorea. The white columns indicate the cases of chorea, the black columns the cases of heart disease.

on admission, and in no case developed under observation. Of the 49 mixed choreas with a history of other rheumatic manifestations, 32 of them, or 65 per cent, had heart disease, of which 22 per cent showed a considerable degree of involvement.

During the past three years I have been fortunate enough to have under close observation 4 cases of active chorea with no heart disease on admission and no history of a previous rheumatic manifestation. Three of these developed joint pains and the fourth a severe upper respiratory infection while under observation for their chorea. They all developed heart disease. The histories follow.

CASE 1

R.C., female, aged 10 years, was admitted in March, 1935, with a mild chorea. The tonsils were removed and the teeth attended to. No heart disease was present at this time. She was discharged in June and was judged sufficiently well to return to school in September. There was a prompt mild recurrence of her chorea. Shortly after, she commenced to complain of pain in the back of the neck, and on examination of the heart a moderately loud apical systolic and a short mid-diastolic murmur could be heard. The mid-diastolic murmur could no longer be heard when she was re-admitted in November with a mild chorea for 6 weeks. Almost a year later, September, 1936, she was again admitted for two months with a moderate chorea and a mitral insufficiency. The electrocardiogram was normal. In March, 1937, a definite short apical rumbling mid-diastolic murmur reappeared, and the x-ray showed moderate enlargement to the left. A year later, March, 1938, both apical murmurs were still present.

CASE 2

R.K., female, aged 10 years, was admitted in February, 1935, with a severe chorea. On admission there were no murmurs. During her stay in the pavilion she developed nose-bleeds and joint pains and, shortly after, a soft apical systolic murmur appeared, which gradually became louder and x-ray showed slight enlargement. In January, 1936, a year later, when re-examined in the outdoor, the heart was found to be enlarged and a loud apical systolic murmur could be heard.

CASE 3

R.P., female, aged 10 years, was admitted on January 31, 1938, with a severe chorea which had been present for three weeks. There was a temperature of 101° on admission, due to an upper respiratory infection which had been present for a few days. The temperature subsided the following day. The heart was normal on admission. On February 5th, after a latent interval of a week following the upper respiratory infection, pains appeared in both wrists, and the electrocardiogram conduction time was 0.2 seconds. X-ray of the sinuses showed thickening of the mucous membrane of both antra and cloudy ethmoids. On February 7th the heart showed slight enlargement to the left on percussion and a loud blowing apical systolic and a rumbling mid-diastolic murmur were heard for the first time. An x-ray of the heart on February 28th showed moderate enlargement to the left and posteriorly. An electrocardiogram on March 2nd showed a conduction time of 0.18 and a right axis deviation. During the month of March the mid-diastolic murmur gradually disappeared and the systolic murmur became much softer.

CASE 4

N.M., female, aged 4 years, was admitted on February 12, 1938, with a moderately severe chorea which had been present for a week. Two days previous to admission she developed a sore throat, cough and high fever. Examination on admission showed enlarged, infected tonsils, and evidence of consolidation over the right base and normal heart sounds. The temperature persisted for three days. On February 25th, two weeks after the onset of the upper respiratory infection and pneumonia, the heart showed for the first time a moderately loud apical systolic and a short mid-diastolic murmur. An x-ray on March 2nd showed a heart slightly over average width and a resolving pneumonia. On March 29th the above murmurs could still be heard.

DISCUSSION

Most observers regard chorea as a manifestation of rheumatic infection with the outstanding exceptions of those I have previously mentioned.

I attempted to separate the pure choreas from those associated with rheumatic infection by means of the Dick skin test for scarlet fever. I found, however, that the Dick test was positive in a number of pure choreas as well as in mixed choreas. This applied whether the tonsils were present or absent.

In analyzing the predisposing causes, I found the age incidence and the economic level at home similar to that in rheumatic fever. Both conditions are present most frequently between the ages of 6 to 12 years and tend to disappear at puberty, the choreas perhaps more abruptly. Both occur in the poor, who usually live in unsanitary surroundings. The sex however, is predominantly female in chorea. In both conditions heredity has endowed the child with a nervous constitution. In chorea the child is usually thin, active, nervous and emotional, so much so, that the term "chorea temperament" has been coined. I have yet to see a fat, phlegmatic type of child develop chorea. As for the active causes of chorea, I am inclined to think that the psychic element plays a much greater rôle than has been attributed to it in the past. Three of our cases followed a tonsillectomy; one was cured by wearing glasses; in another chorea developed after the child fell into a swamp; and still another followed the death of a grandfather, and so on. The number of recurrences of chorea in children does not seem to play a part in the development of heart disease. There is nothing to suggest that chorea is an infection from the standpoint of its clinical course, temperature, pulse or blood count. Struthers and Bacal[18] have demonstrated a consistently normal erythrocyte sedimentation rate in uncomplicated chorea. I have shown that those cases with heart disease have usually had a history of rheumatic infection or infected tonsils with repeated upper respiratory infections.

I have yet to see a case of chorea develop heart disease under observation on the ward, unless there has ensued joint pains or a severe upper respiratory infection in the presence of infected tonsils. For too long we have regarded chorea as simply a major rheumatic manifestation and have therefore treated these cases with prolonged rest in bed, sedatives, and removal of diseased tonsils and teeth. In the treatment and follow-up there has been a tendency to neglect the basic nervous constitution of the child and its susceptibility to psychic trauma, which is something entirely apart from any exposure to the rheumatic virus which that same child may have been subjected to. Failure to direct our treatment along those lines explains in great part, I believe, the frequent recurrences which take place after discharge from the hospital.

SUMMARY

1. One hundred and five cases of chorea have been followed during a period of three years in a special rheumatic pavilion and the outdoor cardiac clinic of the Children's Memorial Hospital.

2. Fifty-six were pure choreas and 49 were mixed choreas, associated with other rheumatic manifestations.

3. Definite heart involvement was present on admission in 27 per cent of the pure choreas, and, if those cases with infected tonsils and repeated upper respiratory infections are omitted, only 14 per cent were associated with endocarditis.

4. In the group of mixed choreas 65 per cent showed heart disease, of which 22 per cent showed a considerable degree of involvement.

5. Valvular heart disease in cases of chorea is due not to chorea *per se* but to intercurrent attacks of polyarthritis or severe upper respiratory infections associated with infected tonsils.

6. It is important as regards treatment and prevention of recurrences to lay more stress on the psychic element in chorea. Removal of foci of infection does not cure chorea.

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Case Reports

A CASE OF GRANULOMA OF THE LACHRYMAL CANALICULUS

BY JOHN V. V. NICHOLLS, B.A., M.Sc., M.D.*

Mandviwalla Free Eye Hospital,

Karachi, India

An unusual case came to the Mandviwalla Free Eye Hospital, Karachi, India, for treatment in March, 1938.

The patient was a healthy-appearing woman of about 60 years of age. She complained of a small pea-sized mass in the margin of the right upper lid about 2 mm. to the nasal side of the punctum. This had been developing over a period of three years. The only symptom she had was a feeling of fullness in the region, particularly on closing the eyes. On examination the mass was found to be attached to the skin over it and to the deep structures. The skin covering it showed no signs of inflammation or other involvement. The only other abnormality of the eyes was a few fine conjunctival scars along the upper border of the tarsal plate of each eye, apparently the result of a previous mild trachoma. The mass was removed under local anæsthesia. The skin over it was incised in line with the margin of the lid, and a fibrous non-encapsulated mass the size of a small pea was removed by blunt dissection. The wound was closed with two interrupted fine silk sutures. Healing rapidly took place with no complications.



Fig. 1.—(High power; formalin fixation; hæmatoxylin and eosin). At the upper side of the field a portion of the compressed canaliculus can be seen. It is surrounded with granulation tissue consisting of a delicate fibrous-tissue stroma filled with lymphocytes and plasmocytes.

The tissue removed was fixed in a 10 per cent formalin solution. Sections were cut and stained in the pathological department of the Royal London Ophthalmic Hospital by the courtesy of Mr. C. Dee Shapland, F.R.C.S., the pathologist. I am greatly indebted to him and Mr. Affleck Greeves, F.R.C.S., for their assistance in diagnosis. The sections showed a non-encapsulated mass of granulation tissue surrounding and compressing the lachrymal canaliculus. This granulation tissue consisted of a stroma of fine fibrous tissue filled with lymphocytes and plasmocytes. Here and there a few scattered endothelioid cells could be seen with the rare small giant-cell containing not more than four large oval vesicular nuclei. The mass was comparatively avascular and contained no areas of necrosis. No organisms or foreign bodies could be found.

There is some difficulty in assigning a definite etiological factor as this pathological picture presents no special diagnostic features. However, the presence of old trachomatous scars in the conjunctiva of both eyes gives some help. Also the pathological picture of the mass is not unlike that found in the trachoma lesions of the conjunctiva (Parsons,[1] MacCallan[2]). In the absence of any other evidence one is forced to assume that this was a trachomatous affection of the lachrymal canaliculus. A search of the literature has disclosed only one previous report (Cirincione[3]) of such a condition. However, trachomatous affection of the lachrymal sac has been described by many. (MacCallan and Sobhy[4]). Because of its rarity it was thought desirable to report this case.

My thanks are due Sir Henry Holland, Ophthalmologist to the Mandviwalla Free Eye Hospital, Karachi, India, for his permission to report this case.

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A CASE OF RUPTURED ACHILLES TENDON

BY J. DOUGLAS GALBRAITH, M.D., L.M.C.C.

Bella Coola, B.C.

Mr. J.L.N., aged 45 years, was admitted to the Bella Coola General Hospital with the history that as he was running after a cow he had stepped on a small stone and felt something give in his lower left leg. This was accompanied by a sharp sound. He volunteered the information that he had broken the tendon at the back of his heel, and demonstrated that he could feel a notch where the break had occurred.

The patient was unable to raise his heel off the ground, although he could walk with the assistance of a cane very well. Very little pain or swelling was associated with the injury.

Further enquiry revealed that the patient was a war veteran and had suffered a very severe attack of influenza during the war. He was discharged as being in good condition, but shortly after began to develop some tremor in the right hand which later was diagnosed as paralysis agitans. At the time of admission this involved all the extremities, although very little rigidity was present. The patient was otherwise in good health.

Operation was done, using neocaine as a spinal anæsthetic. The patient was placed face down on the table, and a curved incision nine inches long was made over the place of the broken tendon, extending up the calf of the leg. Examination revealed that the tendon was completely separated about one and one-half inches above the insertion. The distal segment was fairly intact, in that it was not frayed, but the proximal segment was badly frayed for three inches, extending up from the point of rupture. Apparently the force of this trivial accident had been applied in such a way as to cause the complete rupture of this strong tendon and had shattered the proximal tendon so that it hung in shreds. Braided silk, No. 9, was used to join the two segments. In all, four strands were used to bridge the gap, and as these were tightened the broken ends were approximated. By cutting high under the upper end of the incision a splice of tendon was brought down that was long enough to reach the distal segament. This was anchored at each end by medium silkworm-gut suture. This procedure was repeated in another location. The strands of silk were buried as deeply as possible into the frayed ends of the upper segment by passing catgut No. 1 around the tendon. This also bound all the tendon, the suture, and the splices into one band that was fairly compact. The strength of the tendon now was tested by putting some strain on it and it seemed quite firm. It appeared, if anything, that the tendon was shortened, judging by the position of the foot.

The subcutaneous tissue was closed with plain catgut and the skin with dermal suture. The whole leg was then enclosed in a cast extending well up to the mid-thigh region. The knee was slightly flexed and the foot plantar-flexed. On the fourth day the cast was cut open along its sides, and mild passive and active movements started. The cast was replaced between these exercises, and held in place by adhesive tape. The skin sutures were removed on the tenth day and the patient was allowed to sit out of bed. In three weeks he was allowed to walk, using crutches, and to put some weight on the injured leg; the cast was discarded at this time.

Five weeks after the operation the patient visited the out-patients' department, and demonstrated that he had sufficient strength in the tendon to raise the heel off the floor by standing on his toes.

Therapeutics and Pharmacology

SOME OBSERVATIONS ON CARCINOMA OF THE PROSTATE

By N. E. Berry, M.D.

Kingston

When carcinoma of the prostate appears after sixty years of age, at the time when prostatic obstruction is most common, the clinical picture may be essentially the same, and it is only on routine rectal examination that suspicion is aroused. When it occurs in younger persons the history is often one of rapidly developing obstruction, with pain in the back and legs from metastases in the pelvic glands and bones. It is, of course, well known that sciatica and prostatic obstruction in an old man are strongly suggestive of carcinoma of the prostate, but are equally suggestive in a man of fifty years of age, and a relatively larger proportion of all cases of obstruction of the neck of the bladder at this age are malignant than in the later decades.

At times, symptoms of secondary involvement may arouse the first suspicion that anything is wrong, and there may be nothing to call attention to the prostate. Such manifestations may take the form of neuritis, girdle-pains, "kinks" in the back, or dull pain in the bones, more especially the pelvic girdle. The patient may come in complaining of digestive disturbances from abdominal involvement or general cachexia from widespread metastases. Hæmaturia, so prominent a feature of other growths of this tract, is characteristically absent. It is more commonly seen in patients with large benign prostates than with carcinomatous ones. Acute suppression of urine from obstruction of the ureters may be the first thing to bring the patient in.

The diagnosis is made primarily by rectal examination, and with only moderate experience one can be reasonably accurate. The typical fixed, nodular prostate is easy of recognition. The gland may or may not be enlarged. No practitioner can be expected to pick out the border-line cases, but when his suspicion is aroused he can have his opinion checked. Carcinoma is confused usually with chronic inflammation and calculi. A history of prolonged urethritis or tuberculosis of the genito-urinary tract will confirm the former, and an x-ray, the latter. If the prostate were examined routinely on all patients over fifty the average man would become much more proficient and many more correct diagnoses would be possible.

Carcinoma of the prostate is a very insidious disease. Frequently it is far advanced before the patient suspects anything to be wrong, and even advanced cases may go on for incredibly long periods. We have recently seen a case in which a diagnosis of carcinoma had been made ten years previously and radon implanted. Resection confirmed the diagnosis and recovered the seeds. The patient is still in good condition. On the other hand, in an early case death may result in six months from widespread metastases.

It is extremely difficult to give a prognosis. Generally speaking, the older the patient and the larger the gland, the slower the progress. The presence of much residual urine hastens

the downward course. The average patient goes one to three years after a diagnosis is made. One has had the rather unique experience of seeing a large number of patients with carcinoma of the prostate who came to the city from a very wide area to take a special treatment. Many of these patients had been treated by the outstanding men of America by various methods; the results were uniformly bad.

There are cases where an isolated malignant nodule may be recognized and cure be effected by radical perineal operation or radiation, but for all practical purposes the practitioner cannot hope to ever see such a case, and consequently it may be assumed that every patient with carcinoma of the prostate one ordinarily sees will die of the disease. This is undoubtedly a gloomy outlook, but it is a fact we might as well face, and since we cannot cure these patients it is our duty to be certain we do nothing which will add to their misery.

Two features only require treatment—obstruction of the vesical neck and pain. A patient who has only slight obstruction requires no surgical treatment of any sort. Even when obstruction is present, if carcinoma of the prostate is even suspected, under no circumstances should a suprapubic enucleation be undertaken. While the occasional case will do well, we have far safer and equally efficacious methods of relief. All who have had any experience will agree that transurethral resection will effectively and usually permanently relieve these patients. Regardless of the divergences of view on the application of this operation in other cases, agreement is practically unanimous on this point. While patients with carcinoma in general are not desirable surgical risks, they do surprisingly well after resections. Being in a position to look back to the days before resection, when enucleations were attempted and patients were obliged to wear suprapubic tubes and foul-smelling receptacles, one can appreciate what this operation has meant to these sufferers.

Pain from metastatic involvement can usually be controlled with high voltage treatment. But even with modern dosage it is doubtful if it has any appreciable effect on the actual progress of the disease. Some cases seem to go longer than one expects, but the same is true of cases treated with morphine. For this reason one feels that radiation should not be given routinely, but only in selected cases. Radium may give results in the hands of a few men, though I doubt it, and for all practical purposes it has no place in the treatment of carcinoma of the prostate.

SULPHANILAMIDE AS A PREVENTIVE OF SCARLET FEVER

Sulphanilamide, the drug discovery of the decade, has its place in preventing as well as in curing scarlet fever.

Take the case of the eleven English choir boys, one of whom contracted scarlet fever while in Chicago. He was taken to the municipal contagious disease hospital and then there were ten. The 10 were given 20 c.c. each of pooled convalescent scarlet fever serum. On the eighth day one of the group took scarlet fever; then there were nine. Mild forms of scarlet fever and streptococcic sore throat seized four others and then there were five. The final five remained well, the same five that had been given sulphanilamide during the course of their isolation. The other six (who did not receive sulphanilamide) recovered after varying periods of convalescence.

The story of the eleven little choir boys is used by Drs. Wallace Sako, P. F. Dwan and E. S. Platou, of Minneapolis, (*J. Am. M. Ass.*, 1938, **111**: 995), in an article on sulphanilamide and serum in the treatment or prophylaxis of scarlet fever.

These doctors report:

1. Among 100 cases of scarlet fever treated with large doses of sulphanilamide complications developed in eight. Among 100 similar cases in which the drug was not given, complications occurred in forty-one.

2. Scarlet fever is strikingly modified by early massive doses of antitoxin contained either in human convalescent serum or commercial horse serum.

3. Human convalescent serum, although it has a lower antitoxic titre per c.c., has a distinct advantage over commercial antitoxin with respect to safety for intravenous use.

4. Pooled human convalescent serum (20 c.c.) failed to prevent streptococcic invasion of scarlet fever in 5 of 10 boys who were intimately exposed to it, whereas 5 who received additional therapy (sulphanilamide) did not contract the disease.

5. Commercial antitoxin in their experience has failed to protect several persons against the streptococci invasion of scarlet fever.

6. Early massive intravenous serum therapy combined with continued large doses of sulphanilamide seems to be the most effective treatment for scarlet fever.—*Science News Letter*, 1938, **34: 197.**

Clinical and Laboratory Notes

FRACTURE OF THE JAW*

BY FULTON RISDON, M.B., F.R.C.S.(C.), D.D.S.
Toronto

In this short paper I have made no attempt to review the accredited literature or the history of treatment of fractures of the jaw, but have endeavoured to outline my experience and describe methods that I have found to be of value, some of which are original, but, generally speaking, were introduced by other workers within the last few years.

The etiology of the fractured jaw resolves itself into, first, force, and, secondly, pathological changes in the bone, such as osteomyelitis, cysts, malignant growths, gumma, etc. It is my purpose in this brief discussion to consider the cases that are due to accident.

Impacted fractures, either in the lower or upper jaw, may present some difficulty in diagnosis, and also some confusion may arise where the surgical neck of the condyle or the coronoid process is fractured, but good stereoscopic x-rays will be invaluable, taken in the Waters position, the so-called postero-anterior position, and direct or oblique lateral views of the head. Any teeth in the line of fracture should be removed before reduction. In the upper jaw the most common fractures are through the antrum, the infraorbital border of the orbit, the nasal, malar and zygomatic bones, and in the lower jaw in the region of the angle, the cuspid or canine tooth area, or the surgical neck of the condyle. I am of the opinion that reduction of these fractures should be attempted as early as possible, and seldom is it necessary to wire through the bone or use a negative external splint.

When early reduction is attempted the displaced bones can be moved forward by manual manipulation, and generally without any instruments, especially the nasal bones. I favour the introduction of a finger into the nose to elevate the bones, and if that is impossible a very thin instrument may be used, but finger manipulation is much to be preferred when such can be accomplished. By holding the nasal bones externally between two fingers, with this internal manipulation, the proper contour of the nose may be restored. The nasal bones must be maintained in position by a splint which makes external pressure over the nasal bones, and some method of maintaining the elevation from within the nose must be devised. Seldom should nasal packing be employed, as many of these fractures are close to the cribriform plate and drainage would be obstructed. I am aware that there is a slight risk in this manipulation, but over a period of years I have been agreeably surprised that very little disturbance has followed such treatment, and by carrying out this plan a hideous deformity is easily corrected. The advantages are many, chiefly that the patient will be able to leave the hospital early and subsequent operations to restore the contour will be avoided. While these latter operations are of considerable value, the proper restoration of the bones as early as possible is much to be preferred.

In treatment of fractures of the mandible simple interdental wiring was advocated many years ago, but the author has recently devised a method which can be introduced into any operating-room, provided that the ordinary ligature wire as used for the regulation of teeth is available. This wire may be obtained through any dental supply house and is known as coarse Angle wire, number 187. One strand of this wire is placed around an upper molar tooth and is twisted firmly on itself as far forward as the central teeth, and the same on the opposite side. These wires are then twisted together over the central teeth. Following this, each tooth is wired to this newly constructed wire arch. The same procedure is carried out on the lower teeth. We now have a wire arch on the upper jaw and a wire arch on the lower jaw which is firmly attached to the teeth in both jaws. Interdental wiring binds the lower to the upper and at any time, this interdental wiring may be divided without disturbing either wire arch, for inspection of the fracture. Further, a fracture in the upper jaw may be treated in the same way, that is using the mandible for a splint, whereas if the fracture is in the mandible the upper jaw may be used as a splint.

If a number of teeth are missing it may be necessary to have the attending dentist construct a facsimile cast splint which may be cemented to the upper jaw as well as to the lower jaw. These are wired together, but this appliance is seldom necessary if teeth are present.

There is a special method for treating a fracture of the mandible where all teeth are missing that is known as circumferential wiring. This merely consists of introducing the lower denture over the fractured mandible and by throwing wires completely around the mandible in three places, but not through it, the denture is held firmly against the mandible, acting as a splint.

A number of methods have been devised for the correction of depressed malar and infraorbital fractures. One author suggests introducing an instrument at the hair-line above the malar bone or the zygoma, slipping it internally to the zygoma, down to the position of the malar bone, and then elevating this area. I prefer to make a small opening in the region of the canine fossa, directly elevating the malar bone or infraorbital ridge, then packing the antrum

* A paper read at the Sixty-ninth Annual Meeting of the Canadian Medical Association, Section of Surgery, on June 22, 1938, at Halifax, N.S.

for eight to ten days with iodoform gauze. This method I have found to be very satisfactory.

There are many other fractures about the face, but in this brief paper they cannot be completely discussed, nor are we considering fractures where there is a marked laceration of brain tissue or where there has been some recent central disturbance. Emphasis is placed, however, on the method introduced by the author, namely, the wire arches on the upper and lower jaws. I believe that more or less complicated splints are necessary to retain the elevated position of a depressed fracture of the nasal bones, I prefer the Straith splint, with modifications which I have devised. When a nasal splint of this type is used it should be maintained in position for eight, twelve, or fourteen days, and for a simple fracture of the jaw the splint is retained for three to five weeks, provided the case has been splinted within the first week after injury.

If the fractured head of the condyle is dislocated it should be reduced by manipulation and passive movement started about the tenth day to avoid a trismus.

A non-union may result in some cases of fractured jaw, owing to the loss of bony substance. The cause of non-union is excessive movement resulting in eburnation of the two fragments. Consequently, at the time of the bone-graft operation it is necessary to cut back to bleeding bone. In such cases we allow for an interval of six to seven months after the last appearance of any suppuration. Then a sterile bone-graft is introduced through the neck, using the crest of the ilium. Interdental splints are cast of Victoria metal and they are maintained in position for two to three months.

Editorials

THE STRENGTH OF THE ASSOCIATION

IT will be noticed that this issue contains an unusual quantity of material regarding our Association. The object of all this is quite obvious. We wish to strengthen the Association. Its growth has been most encouraging; its activities are increasing; there is in it an unmistakable sense of vigour, of self respect, of determination. And yet we know that the Association does not attract to its membership even as much as 50 per cent of all the practitioners in the Dominion. Why is this so? Is there something wrong with the Association, or is there something wrong with those outside of it?

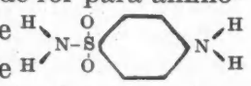
If the fault lies with the Association, it lies with ourselves: who else? The object of our Association is, in essence, that of education, first of ourselves, its members, next, perhaps indirectly but just as definitely, the public. This is a high calling. Is it any wonder that the history of the Association shows a long period of obscure and apparently insignificant struggle by only a small band of men? But they were our best men and their work was not wasted. If we have failed to carry on their struggle for improvement, to that extent we have committed the fault for which we are examining ourselves. Let us remember that the life of the Association can only be as vigorous as we make it. We cannot all be leaders, nor can we always experience the exhilaration of well defined returns for our work. Much of what is called "support of the Association" is given by steady adherence, by attendance at meetings, by thinking continually how to forward its aims; all of which may seem humdrum:

> We cannot kindle when we will
> The fire that in our heart resides,
> The spirit bloweth and is still,
> In mystery our soul abides.
> But tasks in hours of insight willed
> Can be through hours of dark fulfilled.

What then about those who will not join the Association? Is it that they care for none of these things? Which things? The tangible, financial and material profits derived from membership, or the intangible, much more to be desired, validities of wider interests and richer mental and social relations? Of course, they care for all of these (in fact non-members share equally with members in a great many of the tangible benefits of the Association). It is largely indifference which keeps men out of the Association. That has always been and always will be our worst enemy. It behoves us to overcome it by giving continual proof of our worth.

H.E.M.

LEADS IN BACTERIOLOGICAL CHEMOTHERAPY

THE name sulphanilamide for para amino-benzene sulphonamide  has been adopted by the Council of Pharmacy of the American Medical Association, and has, fortunately, replaced to a large extent proprietary names, although prontylin and prontosil album still survive. This drug is now generally accepted as of great value in the treatment of many infections, especially those due to beta-hæmolytic streptococci, specifically in streptococcus septicæmia, meningitis, pharyngitis, tonsillitis, otitis media, mastoiditis, puerperal fever and erysipelas. It is also potent against the meningococcus (septicæmia and meningitis), the gonococcus, the majority of organisms causing urinary infections, *Cl. welchii*, some strains of pneumococcus type III, and *Plasmodium malariæ*. On the other hand, the results in streptococcus peritonitis, endocarditis, adenitis and abscess, in scarlet fever, and in rheumatic fever, rheumatoid arthritis, and chorea are not favourable, except for a possible reduction in the complications of scarlet fever. Too few cases of streptococcus pneumonia have been reported to warrant accurate conclusions being drawn although sulphanilamide has been successfully injected intrapleurally in streptococcal empyema.

One of the main requisites for successful treatment is suitable dosage. Thus in severely ill patients a concentration of drug around 10 mg. per 100 c.c. (1/10,000) is recommended, and good results will not be obtained with inadequate doses in such patients. As a quantitative test is now available for estimating the amount of sulphanilamide in the blood and body fluids anyone treating cases of septicæmia or meningitis should make certain that the early doses are sufficiently large and repeated often enough to enable this efficient concentration to be reached rapidly, after which adequate maintenance dosage should be inaugurated to preserve this required level. Another point of prime importance in using sulphanilamide in large doses is to realize that the most severe toxic actions of the drug are on the blood, and one should be prepared to examine the blood at least daily for signs of anæmia or agranulocytosis, as prompt removal of the drug and drinking large quantities of water will lead to recovery.

It will be remembered that the original chemical used successfully in the treatment of streptococcal infections in mice and man was not sulphanilamide but the more complicated azo dye, prontosil, 2:4 diaminoazobenzene-4'sulphonamide. Sulphanilamide was the first radical chosen for intensive study, as this seemed to be equally active against infections *in vivo* and also was not more toxic than the parent compound. In the meantime the activity of a number of derived chemicals which differ in toxicity, solubility, rapidity of excretion, and in their effect on different bacteria has been tested in the treatment of bacterial infections. A most significant finding is that the antibacterial effect of these various compounds does not run parallel with their sulphanilamide content. It has thus become necessary to examine in an equally intensive manner other molecules liberated when different linkages of the original azo dye are split in the body. It appears at present that the important chemical linkages of the potent compounds are the amine radical in the para position of the benzene ring, but especially sulphur in various functionally active states. Of these as stated above only the sulphonamide has been extensively appraised in therapy. It is obvious that representatives of the sulphonate, sulphide and sulphone compounds will receive equally extensive trial since it has already been shown that some of these have a curative effect on streptococcus infection in mice although they are not converted into sulphanilamide in the body.

It will thus be seen that we are just on the threshold of knowledge of bacteriological chemotherapy, and other compounds may prove to be even more potent in the diseases already known to be susceptible to sulphanilamide as well as in the infections enumerated above and in numerous others, *e.g.*, tuberculosis and typhoid, where sulphanilamide itself is apparently not active.

When new preparations appear it is greatly to be hoped that the chemical formula be

supplied with the trade name. It is only in this way that one can expect to know with what active radical he is dealing in proprietary preparations. The present large list—prontosil, prontosil soluble, streptozon, uleron, septazine, soluseptazine, diseptal A and C, etc., will be extended and the difficulty multiplied. Charts such as that published by Holman and Duff are particularly useful in correlating the chemical formula with the proprietary name. Of one thing we can be certain and that is that the claims of all new chemotherapeutic agents will be adequately confirmed before they are released for sale.

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ARNOLD BRANCH.

MEDICAL STANDARDS IN AVIATION

IN these days of stress, when there are wars and rumours of wars, the science of aviation has come to assume one might almost say paramount importance. It is obvious, too, that flying is a pursuit so exacting that it demands quite exceptional qualifications. Not only must the prospective aviator be a superman, physically speaking, but his special senses also must conform to definite functional standards, and he must be possessed of what may be called "flying sense". Failure to measure up to the standards laid down means loss of expensive machines and, what is even more important, a deplorable loss of life. Standards must be high and examinations searching. Medical men are, of course, concerned in all this.

A thorough general physical examination should be made, and the candidate's history investigated, particularly in regard to respiratory and cardiovascular efficiency and nervous stability. The organs of special sense, eye, ear, nose, and throat, and the general nervous system demand thorough study by specialists. It is widely accepted that the standards laid down in Air Publication No. 130 (1936)[1] are those best adapted for the purpose.

Dr. L. G. Cargill, in a lecture delivered before the Noon-day Study Club, of London, Ont.,[2] gives a useful summary of some of the investigations and tests employed, from which we take the liberty of quoting.

"1. *Cardiovascular efficiency.* The normal pulse rate for the candidate is ascertained. After exercise the rate is taken every five seconds and the time recorded for its return to normal. A longer time than twenty seconds invariably indicates cardiovascular instability or nervous instability. Blood pressure for the candidate is best when the systolic is found to be 120-30 mm., with the diastolic between 75 and 80 mm. The average pulse pressure is best at 40 mm. A diastolic below 70 mm. or a pulse pressure more than 50 mm. indicates a liability to faint when under tension.

"2. *Vital capacity:* Taken by a spirometer, should be 3,500 litres or over, thus ensuring adequate oxygenation of the blood at an altitude.

"3. *Ability to hold the breath:* When under 45 seconds indicates instability of respiratory efficiency.

"4. *Expiratory force:* Using a U-tube manometer, a poor subject is detected when the force is registered under 80 mm. This points to lack of abi ity for maintained effort.

"5. *Tremors:* These reveal heightened nervous excitability.

"6. *Balance.*

"7. *Endurance:* Using the U-tube manometer, the pulse of the poor subject is found to increase in rate to 130 or more per minute in the first 10-15 seconds. Sudden drops in rate indicate cardiovascular instability. The maintenance of a relatively steady rate during the test indicates efficiency in this system and stability of control."

The examination of the nervous system should cover the following points:—Co-ordination, reaction time, mental alertness,

1. Air Publication No. 130 (1936): "The Medical Examination for Fitness for Flying" (Royal Air Force and Civil). Published by His Majesty's Stationary Office; price 2s. net.
2. CARGILL, L. G.: Medical aspects of aviation, Medical Discussions, The London Life Insurance Co., London, Ont., 1938.

and the condition of the sensory and motor tracts.

Of fully as great importance is the testing of the power of vision, which should be done only by a trained oculist. The examination should cover the history of former eye troubles, the external examination, visual acuity and visual judgment, the visual fields, the humours, lens, and fundi, and the muscular balance.

Chronic conjunctivitis with erosion of the margin of the lids, chronic blepharitis, and recurring ulceration are causes for rejection.

A high degree of visual acuity is called for in flying. The standard exacted is 6/6 with both eyes separately at 20 feet, using standard test types under proper illumination. There are two exceptions to this rule. A candidate who is otherwise exceptionally fit may be accepted with a visual acuity of 6/9 or better, all letters and each eye taken separately. And, secondly, no candidate, regardless of his visual acuity, may be accepted if he possesses a manifest hypermetropia of 2.00 or more dioptres.

Visual judgment is of even more importance than visual acuity *per se*. Here the quality and amount of binocular vision come into thought. The appreciation of the spatial relationships of objects is a matter of education and is a development from early infancy; eventually it comes to be based on successive experiences. Perfect binocular vision is the basis of accurate objective judgments. For accurate orientation perfect balance of the external ocular muscles is essential. In the case of the aviator this matter is of special importance, for the moment the aeroplane rises the pilot loses the one known factor on which he ordinarily bases his judgments as to position, namely, contact with the ground. The lack of proper muscle coordination is proved to be the most common cause of errors in judgment when bringing a machine to a landing. The following tests with various instruments are laid down absolutely for the detection of muscle imbalance. These are (1) the red-green (phorometer) test; (2) tests for distance with the Maddox rod; (3) the Duane cover test for near vision; (4) measurement of the near point of convergence and accommodation; the Bishop Harman diaphragm test, which establishes the exact measure of the power to maintain binocular vision under increasing disability (such as a spin); and (5) the binocular gauge test. In any revision of the standards which have been set up for detecting muscle imbalance it might be well to consider Stutterheim's method of testing with prisms.

Finally, there must be no pathological condition in the media and fundus, and the visual fields must be normal.

Of course, many of the necessary tests to be applied to prospective aviators can only be carried out by those skilled in ophthalmology; still it behoves all medical men in these times, whether specialists or not, to have some familiarity with the standard requirements. Most of the younger graduates have had some practice with the ophthalmoscope, and all are competent to carry out a general physical examination, bearing in mind the special demands of aviation. Every medical man, therefore, should be able to give to those wishing to qualify for the flying corps an opinion as to the likelihood of their acceptance. At least, such examinations will serve to deter those who are manifestly unfit, and enable others who are better endowed to reach the semi-finals and, possibly, the finals, where they will be judged by those most qualified. In this way, time, money and energy will be saved.

A.G N.

THE VALUE OF ORTHOPTIC TRAINING.—The assessment of the value of this treatment depends upon the definition of "a cure". The author considers that in some cases a good cosmetic result is sufficient; some patients only require a moderate degree of fusion, and to aim at a good stereopsis is to aim too high. Judged on this standard one-third of ninety-one unselected cases were cured without orthoptic training. Further orthoptic training succeeded in curing less than half the cases. The greatest disappointment occurred in cases of abnormal retinal correspondence where only three out of fourteen cases were cured by orthoptic training. It is suggested that more squints than is generally supposed can be cured by glasses with or without occlusion. Only cases in which this treatment has failed should be referred for orthoptic training, when a further selection, bearing in mind the end-result desired, is necessary. The results of orthoptic training have previously been described too optimistically in the medical press.—F. W. Law, *Brit. J. Ophthal.*, 1938, **15**. Abs. in *Brit. M. J.*

Editorial Comments

Handbook on Cancer for the Medical Profession

By this time our members will be in possession of a neat book on cancer, which is presented to them without cost and with the compliments of the Canadian Medical Association. It is intended also that a free copy shall be sent to any member of the medical profession outside of the Association who desires to have one. Apply to the General Secretary, Canadian Medical Association, 184 College Street, Toronto, if you have not received it.

This book is one of the Association's contributions to the nation-wide campaign against cancer, now well away to a good start. It has been prepared by an Authorship Committee, of which Dr. Roscoe Graham, of Toronto, was chairman, on instructions from the Department of Cancer Control of the Canadian Medical Association. Special care has been taken to prepare a book that is authoritative and dependable. Before publication all material was submitted to the deans of the Canadian medical schools and to the heads of the Provincial Cancer Committees. The book itself is evidence of the careful scrutiny to which the various manuscripts have been subjected. Its publication has been made possible by a grant of money from the Board of Trustees of the King George V Silver Jubilee Cancer Fund for Canada.

After a discussion of the general pathology of cancer and the principles governing its treatment, the book proceeds to deal with cancer of the various organs. The points in diagnosis are in each case given concisely, but sufficiently, and the appropriate treatment is outlined. No attempt is made to give the details of surgical or radiological technique. The idea is that the book shall be a ready reference guide to the subject, saving the practitioner the necessity of consulting many articles and of sorting out the various, sometimes conflicting, opinions therein offered him. It gives him a summary of the kind of information on which he can depend. Besides, here and there "pearls" of medical wisdom are to be found which may well engage the attention of the experienced man as well as of the man who only sees an occasional case of cancer. The work is admirably adapted for its purpose. It should be kept at one's elbow.

While this book would not have appeared, at least so soon, without the aid of the Trustees of the King George V Silver Jubilee Cancer Fund for Canada it represents an immense amount of care on the part of the special committee which prepared it. This committee deserves well of the profession and our Association can be commended for having undertaken such a valuable piece of work. A.G.N.

The Bulletin of the Health Organization of the League of Nations

Attention is called to the above-mentioned Bulletin, a periodical which deserves more attention in Canada than it has hitherto received. This Bulletin appears now about seven or eight times a year and contains much that would be of interest to universities, health officers, health organizations, and governmental health departments. Some idea of the extent of its field may be obtained from a summary of the contents of the last issue, which also reveals the variety of the work of the Health Organization.

This number includes the report of a committee of experts which was asked to work out a method of assaying the content of morphine in opium and of cocaine in raw cocaine and coca leaves that would meet the practical requirements of a system of international control over the manufacture of narcotics. It also contains the latest report of the Technical Commission on Nutrition, a report by another group of experts on the problem of insolation and lighting in relation to housing and town planning, and reports on three technical investigations—one into undulant fever in France, another into the significance of codeine as a habit-forming drug, and the third into the comparative value of certain reactions for the sero-diagnosis of syphilis.

The report on assaying the content of morphine in opium and of cocaine in coca leaves is a further stage in the research work undertaken by the Health Organization at the request of the Committee on the Traffic in Opium and Other Dangerous Drugs. This report is of a technical character.

The report of the nutrition experts is of general interest because of the full summary which it gives of the results achieved in investigations on a question which is attracting more and more attention, not only of health administrations, but also of the public. This report describes the state of knowledge concerning the requirements of the human organism in various nutritive elements, including vitamins, and especially during the first year of life. One chapter deals with milk, a foodstuff of the first importance, which must be prevented from becoming a vehicle of infection. Another discusses methods of carrying out surveys on nutrition and on the nutritional conditions of populations, which are essential if any progress is to be made in practical work.

The article on insolation and lighting gives a summary of the conclusions reached by a special Sub-Committee of the Housing Commission of the Health Organization.

Other subjects that have been dealt with are the teaching of hygiene, reports from various Pasteur institutes on the results of anti-rabies treatment, the preventive and therapeutic measures carried out in Roumania for the control of malaria with synthetic drugs. The bill of fare provided in the issues we know about is certainly varied and attractive.

The Bulletin is highly commended for its effective presentation of the topic of world-wide health. The price is $3.75 a year.

Those interested may obtain further information on application to the League of Nations Society in Canada, 124 Wellington St., Ottawa.

A.G.N.

The Montreal Meeting—June 19 to 23, 1939

The Central Program Committee, working in cooperation with the Local Committee in Montreal, is now engaged in preparing the program for the Annual Meeting. Any member of the Association wishing to present a paper at the annual meeting will please forward the title of the paper with a short abstract to the General Secretary, 184 College Street, Toronto, not later than December 31, 1938.

Special Article

DIET AND NUTRITION

INTRODUCTION OF SOLID FOODS INTO THE DIETS OF CHILDREN*

BY T. G. H. DRAKE, M.B., F.R.C.P.(C.)

Toronto

X.

Milk alone, either human or cow's, is nutritionally adequate only for the first month of life, after which the rickets- and scurvy-preventing vitamins must be added in the form of fish liver oils and citrous or tomato juices. To prevent the development of other vitamin and mineral deficiency diseases not controlled by these supplements, especially nutritional anæmia, and to accustom the infant gradually to the adult type of diet solid foods must be added to the fluid diet. While the use of thick feedings in the treatment of pylorospasm has shown that cereal feedings may be tolerated as early as 1 month of age, the conservative practice of starting solid foods at 3 to 5 months of age is best. Earlier introduction of solid foods into the milk diet may render the infant sensitive to their proteins, and many clinicians believe that the premature introduction of solids is the cause of many of the digestive upsets encountered in later infancy and childhood.

In introducing solid foods into the diet the regular feeding intervals should not be altered. New foods should be offered one at a time. A small amount (approximately 1 teaspoonful) should be offered at the beginning of one of the feedings on the first day, and the amount gradually increased. With the first solid food, remember that the infant must become accustomed not only to the taste but also to the swallowing movements necessary, since it cannot obtain the solid spoon-fed material by the sucking movements to which it has previously been accustomed. Persistent refusal to take the food is rarely encountered when the new material is introduced at the proper age, but should this occur the meal should be removed at the end of 20 minutes without offering the milk-feeding which the infant likes, and he should be allowed to go until the next regular feeding period, being offered nothing but boiled water in the interval. Force and bribery should not be resorted to, and comments from the audience are barred, since even at this early age the infant usually enjoys the struggle and attention which is too frequently created by his refusal to take the food offered.

Cereals.—In the selection of the cereal, the infant's first solid food, the following points must be considered. The cereal as fed should be thoroughly cooked and of porridgy not gruel-like, consistency. It should not be excessively laxative, and in addition to supplying calories it should contain in liberal amounts the protective minerals and vitamins. These requirements are best met by the use of a cereal mixture* containing wheat, oat and corn meals, to which have been added for their mineral and vitamin content wheat germ, brewer's yeast, machine-dried alfalfa and edible bone meal. "White" cereals, such as farina, consist essentially of the white flour portion of the grain, and, while non-laxative, contain only minute amounts of vitamins and minerals. Whole grain brown cereals, while higher in minerals and vitamins than the white cereals, may be irritating to the infant's bowel on account of the bran content.

Cereals for infants should be cooked for 1 to

* From the Department of Pædiatrics, University of Toronto, and the Hospital for Sick Children, Toronto.

This is the tenth in the series of articles on Diet and Nutrition, prepared under the auspices of the Association's Committee on Nutrition. The previous articles can be found in the *Journal*, 1938, **38:** 277, 387, 491, 586; **39:** 76, 179, 280, 389, 483.

* One such preparation is available under the trade name Mead's Cereal, or in its precooked form "Pablum".

4 hours in a double boiler, in the proportion of ½ cup of cereal to 1½ to 2 cups of water. The water is measured into the upper portion of the double boiler, a pinch of salt added, and the water brought to the boil over the direct flame. The cereal is added slowly with constant stirring to prevent lumping and cooking continued until thickened (3 to 5 minutes). The upper portion of the double boiler is then placed over the lower part, which should be about one-third full of hot water, and the cooking is continued for 1 to 4 hours. To prepare pablum for infant feeding the required amount of the dry precooked cereal is poured into a cereal dish and stirred with a fork while the water or milk and water formula is added until of a porridge-like consistency. *In vitro* and *in vivo* experiments have shown that this cereal is more digestible than ordinary cereals which have been cooked for 4 hours.

At 3 to 5 months of age cereals should be started at the beginning of the 10 a.m. and 6 p.m. feedings, and the amount fed gradually increased until the infant is taking 2 to 4 tablespoonfuls of the cereal as prepared for consumption at each of these two feedings.

Bread. — After the baby's first tooth has erupted he may be given bread dried in the oven, or zwieback or sunwheat biscuits.

Eggs.—Egg yolk should be added to the diet at the 2 o'clock feeding from the sixth month on. On account of the possibility of an allergic reaction manifesting itself, such as a skin rash or digestive upset, egg yolk should be started in small amounts, one-quarter teaspoonful or less, and gradually increased to a whole egg yolk. Eggs may be soft-boiled, hard boiled and mashed, or coddled. From 1 year on the whole egg may be served, either cooked alone, in custards, or in other food.

Vegetables.—The actual energy value, or caloric value, of vegetables is comparatively low; they belong to the protective as distinguished from the energy-producing foods on account of their more abundant mineral and vitamin content. They are especially valuable for the prevention of nutritional anæmia. Green and root vegetables may be included in the diet at the 2 p.m. feeding from the 8th month. To accustom the infant to the different tastes, they should be served separately rather than in mixtures. Selections may be made from carrots, chard, green peas, green lima beans, fresh asparagus, string beans, young beet greens, and cooked lettuce. Spinach should not be served to the exclusion of other greens, to most of which it is inferior nutritionally. When 1 year old the child may also have squash, celery, beets, cauliflower and kale. To reduce loss of minerals and vitamins in discarded cooking water, vegetables should be cooked in the least amount of water possible. The cooking water should be served with the vegetable or used in vegetable and meat soups. The amount of water remaining on green leafy vegetables (with the exception of cabbage) after washing is sufficient for cooking. Green leafy vegetables should be cooked in a saucepan until soft, from 10 to 15 minutes, with frequent stirring to prevent burning. In a double boiler from 30 to 45 minutes usually suffices to cook soft root and stalk vegetables which have been chopped fine. The soft cooked vegetables and greens are put through a sieve or strainer. Canned sieved vegetables are obtainable today, many of which are the equal or superior of the home-prepared article. Baked potato is also valuable, but must not take the place of other vegetables. At the end of the second year sieving is no longer necessary, simple mashing of vegetables being sufficient.

Fruits.—Apple sauce or apricot or prune pulp may be given for supper, beginning with the 10th month. Prunes or dried apricots should be soaked over night and cooked until soft enough to mash through a strainer. Banana when well ripened (shown by the skin presenting brown patches) may be served raw after thorough mashing with a fork. After the first year baked apples, stewed pears and peaches, and scraped raw apple may be included in the diet.

Meat and fish.—Scraped beef may be added in the latter part of the first year. This is prepared by scraping lean round steak across the grain with a dull knife or sharp spoon. The meat thus obtained is made into a patty and lightly cooked under the broiler on both sides, or in the top part of a double boiler over hot water. Later, boiled, broiled or roasted and finely divided beef, lamb, chicken or liver may be used. Steamed, baked or boiled and carefully boned non-oily fresh fish, such as cod, haddock or halibut, may be fed once or twice weekly.

Prohibited foods.—The following foods should not be given to young children: greasy and highly seasoned foods; fried foods of all kinds (except crisp bacon); fresh bread and breadstuffs; pies, cakes and fancy cookies; ice-cream; pork or veal; corn or cucumbers. Coffee and tea should be forbidden, partly on account of their caffeine content but largely because they replace milk. Nuts are hard to digest, and there is risk that they may be aspirated. The consumption of candies will decrease the appetite for the necessary mineral- and vitamin-containing foods. The child may have the amount of sugar commonly employed in cooking, but sugar should not be used on cereals and fresh fruits. It should always be remembered that a child will not cry for a food which it has never tasted.

A diet suitable for the 12 to 15 months old baby is appended.

7 to 8 a.m.

1. 2 to 4 rounded tablespoonfuls of cooked cereal or prepared pablum, with 2 to 3 ounces of boiled milk over it; no sugar.
2. 6 to 8 ounces of boiled milk.
3. 1 piece of zwieback or toast, or 1 to 2 sunwheat biscuits; no butter.

9 a.m.

2 ounces of orange juice diluted with an equal amount of water; or twice this amount of the liquid obtained by mashing factory-canned tomatoes through a sieve.

12 to 1 p.m.

1. 1 egg, or ½ to 1 rounded tablespoonful of scraped beef, or finely divided calf's, beef or lamb liver, or minced chicken.
2. 3 to 4 tablespoonfuls of sieved vegetables.
3. 2 to 3 rounded tablespoonfuls of junket or custard, rice, sago, tapioca or cornstarch pudding, with added milk.
4. 1 piece of zwieback or toast or 1 to 2 sunwheat biscuits. No milk to drink with meal; milk is contained in the desserts.

5 to 6 p.m.

Same as at 7 to 8 a.m., with the addition of 1 to 3 rounded tablespoonfuls of prune or apricot pulp, apple sauce or baked apple.

10 to 11 p.m.

8 ounces of boiled milk if hungry, that is, if the child wakens and cries for food.

1 teaspoonful of biologically standardized cod liver oil two or three times daily, or 5 to 10 drops of percomorphum oil or other fish liver oil of high vitamin D concentration, once daily from September to June.

Retrospect

THE COMMON COLD

By Edwin A. Stuart, M.D., F.R.C.S.(Edin.)

Royal Victoria Hospital,

Montreal

It is not necessary to remind you of how broad the definition of a common cold has been in our not too distant past, and even today it represents anything from a sneeze to broncho-pneumonia to many physicians. On account of the apparent uncertainty as to what constitutes a common cold I find it necessary to classify upper respiratory diseases which have some symptoms in common and likewise quite apparent differences. In this group we find the common cold. Thus we have: (*a*) allergic colds; (*b*) infectious colds. Under the latter we group: (1) influenza; (2) the common cold; (3) the bacterial colds; (4) prodromal symptoms of acute infections.

Allergic Colds

As regards the allergic cold it should not be necessary to give reasons for distinguishing it from the infectious colds. On the other hand, individual cases may at times be difficult to distinguish, and it may only be the protracted nature of the symptoms and the frequent or seasonal recurrence that arouse one's suspicions as to the proper diagnosis. This is the group referred to by such names as "hay-fever", "vasomotor rhinitis" and "pollinosis".

Infectious Colds

Influenza.—Of the infectious group influenza, in its mild form, is sometimes impossible to distinguish clinically from the common cold, but it is usually associated with constitutional disturbances, including elevated temperature, which Dochez claims does not occur in the common cold. I have excluded influenza from the bacterial group of colds as it is now thought to be due to a virus.

The common cold.—The term "common cold", according to Dochez, should be used to denote a group of symptoms including sneezing, coryza, nasal obstruction, dryness of throat, occasional mild headache, often with mild constitutional disturbance, but with no elevation of temperature, and not lasting longer than from 4 to 5 days.

Bacterial colds.—The bacterial colds may commence as common colds, but sooner or later show signs of suppuration, giving rise to nasal or post-nasal discharge, muco-purulent or purulent in character; protracted as regards time and frequently associated with some degree of fever, and often involving the sinuses and lower respiratory tract. The prodromal symptoms of such infectious diseases as measles, scarlet fever and diphtheria resemble the bacterial cold, but are considered by Dochez as a part of the disease which finally becomes manifest.

The Common Cold

Having thus distinguished the common cold, at least fundamentally, from upper respiratory diseases resembling it, let us consider it more particularly. As regards the geographical incidence it is world-wide, and apparently shows no tendency to diminish. It is more common and has a greater tendency to become complicated in the temperate zone, and least common in areas isolated from contacts. As regards its morbidity rate it has been estimated by large surveys in the United States that there are on the average 2.5 colds per capita per year. In one of the more reliable studies which took place at Johns Hopkins between 1928-32 a group of students and also a group of families were examined at least weekly and every illness investigated—the students during the college year of 35 weeks and the family group the year round. Of these four years 1929-30 was selected as the most normal year and figures for that year only are given. The students numbered 937 and in the group colds occurred at the rate

of 3.1 for 12 months. The family group numbered 549 and the rate was 2.7 for 12 months. In the student group 14 per cent were confined to bed and in the family group 20 per cent. This study showed two peaks of susceptibility from 0 to 5 years and in the young adult group. A high incidence in children 8 to 14 months of age is reported by Kneeland and Dawes as a part of their study of colds in a foundling institute. As regards incidence three seasonal peaks are referred to by most investigators: September-October, December-January, March-April.

Causation.—It would appear from the literature that almost every possible approach to the subject has been attempted. The name itself suggests that climatic conditions, particularly cold weather, have considerable to do with the cause. Evidence that this is probably a secondary influence has been produced by Paul and Freese (1933) who conducted an eleven months' survey of colds in Spitzbergen. Spitzbergen is in the Arctic Circle and is isolated for seven months of the year. The survey began by a study of the normal nose and throat flora. In a population of 507 practically no colds occurred during the isolated months, but within 48 hours of the arrival of the first boat in the month of May over 25 per cent of the population had colds and 75 per cent of the residents were affected by the end of one month. In all, about 430 cases of acute upper respiratory disease occurred, of which 393 were considered to be cases of common cold: 820 cultures were taken in both normal and abnormal states. During the period of communication there was a slight rise in the presence of *H. influenzæ.* The authors reported that trips from the city of Lochyear to isolated villages during the months of isolation did not result in colds, but that during the shipping season they did. They also reported that trappers claimed that accidents, such as falling into icy water, were not associated with colds in the winter but were in the shipping season. This suggests that chilling may likewise be a secondary factor in cold production.

Evidence that atmospheric conditions may have considerable influence on the incidence of the common cold was reported by Kerr and Lagen in 1935. These experimenters provided themselves with an air-conditioned room which would accommodate from four to six persons, permitting a normal range of in-door activities. The temperature was maintained at 70 to 71° F. (dry bulb) and 60 to 62° F. (wet bulb) from which the humidity was determined to be about 55 per cent. Air flowed into this chamber at the rate of 66 cubic feet per minute and raised the pressure in the room slightly above normal. Volunteers were selected from men 21 to 40 years of age who were accustomed to have three or more colds per year but who had not recently been ill. These volunteers in groups of from 3 to 5 persons lived in this room for 5 to 8 days, after which a patient with a common cold of 12 to 36 hours' duration joined them. The patient and volunteers engaged in card playing used the same drinking vessel and the same thermometer. They were in intimate contact for 24 to 48 hours, at which time the patient was removed. The volunteers remained 4 to 6 days longer under the same atmospheric conditions. Nineteen volunteers were in this way exposed to the common cold and none contracted the disease. In a second experiment 9 volunteers were inoculated with nasal washings from a patient with a common cold. The untreated washings were used in 4 cases. The discharge was centrifuged and the supernatant fluid was used in 4 cases. Heated, uncentrifuged discharge was used in one control case. Inoculations were made into the conjunctival sacs and none of the volunteers contracted a cold. The two experiments were conducted under the same atmospheric conditions.

I have searched for information on the incidence of colds in the presence of abnormalities of the nose and throat and have met with many differences of opinion. I submit a survey from Johns Hopkins which I do not consider to be entirely satisfactory. The studies were made in 1928-31 to compare the incidence of minor respiratory diseases in students and families divided into two groups: (1) in which the oto-laryngological examination was considered essentially negative, and (2) in which abnormalities were present in the nature of unhealthy tonsils and adenoids, deviated septa, polypi, hypertrophied mucous membrane of turbinates, cloudy antra. The study excluded attacks of follicular tonsillitis, quinsy, pollinosis, acute specific fevers, and illnesses of one day or less. At times the student group numbered 366 and the family group 114; 2,612 "colds" were studied and at no time was there found any significant difference in the frequency or in the severity of the colds in these groups. They claimed that fever accompanied colds in adults where the tonsils were removed or considered normal just as readily as it did in the group with diseased tonsils. However, in the latter group there was a more rapid febrile response. Children with excessive adenoid tissue showed a slightly greater tendency to fever than did children normal in this respect. Dochez interprets these findings to mean that these abnormalities have no primary causative importance but are of secondary importance as regards complications of the common cold.

Barenberg and Lewis report (1932) that extensive prophylactic vitamin A treatment to young children has not reduced the incidence of colds. Barenberg and others found no advantage in treating infants with ultra-violet light as prophylaxis against colds.

Bacterial colds.—The amount of work which has been done on the relationship of bacteria to upper respiratory infections has been so extensive that it is quite impossible to discuss it even briefly at this time, and as an alternative I shall quote Dochez[1] when he says: "The only certain relationship of such pathogens as hæmolytic streptococci pneumococci and *H. influenzæ* is their secondary inflammatory processes". He claims and gives proof that the common cold is caused by a virus. However, before discussing this virus there are some interesting features about the nose and throat flora which should be reviewed.

Dochez studied the nasal flora in 13 normal persons over a period of 4 to 9 months. In the noses he found *Staph. albus* and diphtheroids; in some, *Staph. aureus* and *citreus*; occasionally, Gram-negative cocci and non-hæmolytic streptococci. In the throats he found, Gram-negative cocci, non-hæmolytic streptococci, large Gram-positive cocci, *H. influenzæ*, hæmolytic Gram-negative bacilli and diphtheroids. Transients were *Staph. albus, aureus, citreus,* hæmolytic streptococci and pneumococci. When colds occurred in this group it was noted that there seemed a diminution in the organisms from the nasal secretion and in later stages *H. influenzæ* and *S. hæmolyticus* made their appearance in the nose. In the throat there was a shift from the predominance of Gram-negative to Gram-positive cocci, non-hæmolytic streptococci, and, as the cold progressed, *H. influenzæ, Staph. aureus* and hæmolytic streptococci assumed increased prominence.

From this and other studies it appears that normal persons harbour for variable periods of time potential pathogens without necessarily becoming infected or at least, manifesting signs of infection. Several investigations of the normal accessory sinuses have shown an absence of flora. This is disputed by Fränkel, of Berlin, who claims to find organisms present in normal sinuses. However, it is hard to argue this point on account of the difficulty in establishing the normality of any sinus. Definite bactericidal properties are attributed to the nasal mucosa which may tend to keep the flora in check. Some claim the mucus film protects the mucosa mechanically. Fleming (1922) referred to a bacteriolytic enzyme in the nasal secretion, known as lysozyme, which he claimed to be an active bactericidal substance. Others claim that active phagocytosis takes place on the surface of the mucosa.

Kneeland and Dawes published (1932) observations over a period of years in a foundling institute. They showed that the appearance of bacteria in the nose and throats of infants is not necessarily associated with any inflammatory reaction. They noted that the carrier rate for pathogens began to increase in the early fall from about 15 per cent to mid-winter, when it reached as high as 80 per cent, and the colds varied in severity as did the rate. These pathogens varied from time to time in type and it was observed that when *H. influenzæ* and pneumococci were widely distributed common colds were less common, and influenza and pneumonia more common. The reverse was also true.

The virus theory of common cold is very convincing. It came into being in 1914 when Kruse, of Leipzig, conceived the idea and filtered the nasal secretions of one of his associates suffering from a common cold. This he inoculated into 12 male volunteers with the result that in from 1 to 3 days four colds occurred, characterized by coryza. Later, 15 out of 36 volunteers were inoculated and developed mild colds. In 1916 Foster, in U.S.A., repeated this experiment and cultured the filterable virus on rabbit kidney and was able to prove the virility of his culture on a human volunteer.

Dochez began his virus work about 1930, using chimpanzees as his subjects. These monkeys were found to be very susceptible to the human common cold. The clinical picture of the monkey cold was much the same as in a child, with recovery in about 10 days. The naso-pharyngeal flora is much as in human beings, with a more common appearance of *H. influenzæ* and *S. hæmolyticus. B. coli* is present, from uncleanly habits. His monkeys were rigidly quarantined for 5 to 14 days before inoculation with a filtrate passed through a Seitz filter. The human secretions were obtained by irrigating the nose and throat with buffered broth. The human subject had a cold not more than 24 hours old. The inoculant was dropped into the monkey's nose. The usual incubation period was from 24 to 48 hours. The cold then produced was characterized by increased mucus in the nose and throat, nasal obstruction, sneezing, often loss of appetite, diarrhœa, but practically never fever. Coincidentally with the onset of symptoms pneumococci, *S. hæmolyticus* and *H. influenzæ* greatly increased in the mucous membrane of the naso-pharynx and appeared in the nose, where they are seldom seen. These experiments were controlled by later inoculating the same animals with filtrate from normal human beings, with the result that no colds occurred. The next move was to transfer colds to the human subject. The human volunteers were quarantined. Their naso-pharyngeal washings were filtered and tested out on apes, to make sure they had not already some evidence of cold. They were inoculated just as were the apes, and in 21 volunteers 9 successful transfers were made. The incubation period was 24 hours or less. The duration was one week. The symptoms observed were stuffiness of the nose, sneezing, sore throat and headache. No fever was observed. These experiments convinced Dochez that colds were due to an invisible agent which passed readily through

filters. The increased activity in pathogens of the nose and throat observed in the apes was not so directly observable in human beings, but Dochez believes it to be operative, and to explain the marked secondary activity of such organisms as pneumococci *S. hæmolyticus* and *H. influenzæ*. Dochez next proceeded to cultivate the virus *in vitro*. Filtrates were kept anaerobically under a vaseline seal at room and at ice-box temperatures. Both the filtrates were proved to be active for 13 days. The next effort was to culture the virus. The medium selected was 10 day chick embryo. The washings used were from a man with a severe cold. These were filtered in the ordinary way and inoculated into 3 volunteers. The last volunteer developed a severe cold, and his washings were filtered and preserved for 5 days at ice-box temperature and then cultured on chick embryo medium. The culture was incubated for 5 days at 37°, after which a human volunteer was inoculated and within the usual incubation period developed a mild cold. The cultures were re-seeded from 3 to 9 days. The 15th generation of the above culture was inoculated into three volunteers and two developed very severe colds, complicated in one case by purulent sinusitis and in the other with a tracheo-bronchitis. The first culture was kept active for 106 days. Another strain was active for over a year after 83 generations. Dochez's volunteers have been men between 21 and 60 years of age, normal in every respect, and free from upper respiratory infections for at least 6 weeks. All carriers of pneumococci I, II, and III were excluded. They had been strictly isolated, and for at least 48 hours before tests had been closely watched. Each culture, as a rule, was tried on three individuals. The average experimental cold has an incubation period of about 10 hours. Sneezing and congestion of the nasal passages, dryness of the throat and heaviness of the head, and increased nasal discharge occur in about 10 hours and coryza appears in about 24 hours. The symptoms usually increase in severity for 48 hours and subside, so that normality is reached in about 5 days. Recrudescences after discharge are not uncommon. There is usually a productive cough. Constitutional symptoms are not infrequently noted, but *fever never*. There is increased redness of the throat with enlarged solitary lymph follicles. Severe sore throat is rare. Occasionally secondary sinusitis occurs which may prolong the symptoms for two weeks. When marked cough occurs it usually persists for a number of days. Various control inoculations were used in Dochez's patients with negative results. These consisted of concentrated broth, uninoculated tissue culture medium, heated culture virus, nasal washings from normal persons, culture of virus inactivated. Aerobic conditions are not favourable to the maintenance of infectivity in the virus. After 21 transfers grown aerobically no colds could be produced. Cultures frozen and dried will live for four months, but a fluid culture stored at ice-box temperature tends to lose its infectivity in six days. In apes there appeared to be a natural immunity to the common cold lasting 4 months.

Dochez believes that this virus is the cause of the common cold and responsible for at least 50 per cent of upper respiratory infections. When a temperature elevation appears in a cold Dochez considers it no longer a "common" cold but a "complicated" cold in which bacteria are playing a secondary rôle. He believes that streptococcal infections of the throat with their sequelæ are ushered in by the common cold; this would include cases of rheumatic fever and many cases of acute nephritis. He claims that a careful history of patients with lobar pneumonia will show that 75 per cent of them had a common cold immediately prior to their pneumonia. A recent study of congestive heart failure at the Presbyterian Hospital in New York has been reported and the statement is made that 50 per cent of these failures are preceded by an exacerbation of pathological changes in the heart, subsequent to a common cold.

INFLUENZA

It is important to refer briefly to influenza, as Dochez holds that in some cases it cannot be distinguished clinically from the common cold. It occurs in three types: (1) A mild catarrhal inflammation of the upper respiratory tract without pronounced general reactions or fever, and not severely complicated. This type resembles the common cold. (2) A type characterized by fever, profound prostration and general malaise, which may not be associated with upper respiratory signs. (3) A type like the above with an early involvement of the lung in the form of a hæmorrhagic broncho-pneumonia.

It would seem that the *H. influenzæ* of Pfeiffer can no longer be considered as a primary cause of influenza. Since 1918 efforts have been made by several to produce satisfactory evidence that influenza is due to a virus. Long, Bliss and Carpenter claimed in 1931 to have isolated such a virus and to have transferred influenza from man to monkeys. In 1932 Costa-Mandry and others cast some doubt upon the value of this previous work when they were unable to achieve the same results in the epidemic of influenza in Puerto Rico. Dochez apparently interested himself in the subject about 1930 and experimented with influenza, much as he did with the common cold. For his first human transfer he used the naso-pharyngeal washings from a patient in the first 36 hours of an attack of influenza. This patient had a temperature of 100°; white blood cells, 7,300, and the usual symptoms of moderately severe influenza. These washings were filtered and the filtrate was in-

oculated into the nose of a volunteer. Within 24 hours the volunteer developed the usual symptoms of mild influenza unassociated with fever. By the third day these symptoms abated and the volunteer was discharged from hospital. On the following day he developed an attack of acute pharyngitis with a temperature of 103°, cough and muco-purulent sputum, and continued to be ill for two weeks. A second filtrate was made from a patient with a temperature of 103° lasting for four days; white blood cells 7,000. The usual symptoms of severe influenza were present. This filtrate was cultured on chick embryo medium and transferred regularly for ten weeks, after which time Dochez inoculated two volunteers who developed illnesses resembling the common cold. This culture in its 65th transfer produced a mild attack of influenza with a temperature elevation occurring in 36 hours. In 1936 he reported the results of five different culture strains, and in thirty-nine volunteers inoculated the resulting infections appeared more like common colds than influenza, with one exception. The volunteers were carefully selected and any with positive nasopharyngeal cultures of pneumococci type I, II and III, and *S. hæmolyticus* were rejected. No effort was made to exclude *H. influenzæ* or pneumococci other than above. In discussing the mild form of influenza produced by inoculation Dochez states that in a typical epidemic of influenza many such cases occur. He thought it possible that culturing might have diminished the virulence of his virus or that the absence of pathogens from the naso-pharynges of his volunteers might have been responsible. He is of the opinion that the common cold and influenza are due to viruses closely related in their manifest activities and are probably close in biological nature. He also suggests that these viruses have an activating effect on pathogenic bacteria which, if present, may play a secondary rôle. In regard to this interaction between virus and bacteria this has actually been illustrated by Shope and Lewis working on swine influenza. This disease was recognized in 1918. It is very similar to human influenza. Lewis and Shope isolated the *H. influenzæ* (suis) which they claim resembles exactly non-indol producing strains of human *H. influenzæ*. Cultures of the organisms produced attacks of the disease in only two inoculations out of thirteen. On account of this poor result a filterable virus was sought and found. This virus would produce a definite but mild attack of the disease. However, when the cultures of the *H. influenzæ* (suis) and the filterable virus were mixed in the inoculant the usual form of the disease occurred. Dochez believes the common cold and influenza are frequently confused, and that there are two types of so-called influenza epidemics— (1) due to influenza virus, plus pathogens; (2) common cold virus, with widespread distribution of and enhanced virulence of common pathogens.

BACTERIAL COLDS

I believe there has already been sufficient evidence to strongly suggest that the bacterial contribution in the cause of colds is probably a secondary one; however, not necessarily secondary alone to the common cold as we have described it, but to any damaging influence on the mucosa of the upper respiratory tract, *e.g.*, allergic colds, and any other causes of nasal obstruction necessitating mouth breathing, which may injure the pharyngeal mucosa. It is interesting that during the seasonal incidences for high peaks in common cold the carrier rate for pathogens becomes correspondingly high and vice versa. I can find no explanation for this phenomenon. It is in this kind of cold that we should expect vaccine therapy to be of great benefit. Dochez is convinced that mixed vaccines will confer only slight protection against upper respiratory diseases. Their chief value, he believes, should be in influencing the incidence and course of secondary bacterial complications. He refers to a study along this line by Kneeland and Dawes when 20 infants between the age of 8 to 14 months were vaccinated with cultures of pneumococci, *S. hæmolyticus* and *H. influenzæ* previously found to be the usual secondary invaders at the institute. These children were given 9 weekly injections in the fall and again in the winter and again in March. The same number of unvaccinated infants were studied as controls. There was no reduction in the number of simple colds or of infections associated with fever in the vaccinated group, as compared with the unvaccinated. There was, however, an apparent reduction in the severity of the infection in the vaccinated group, as judged by duration of the febrile period. This was shortened by 40 per cent. There were 5 cases of lobar pneumonia among the unvaccinated and only one case among the vaccinated. They claimed the technique of producing such immunization was too difficult to promise much for general use.

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Men and Books

ANTIQUE ENGLISH DELFT POTTERY OF MEDICAL INTEREST*

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The technique of tin-enamelling earthenware was well established in Spain in the 14th and 15th centuries, having been introduced by the Moors from the eastern Mediterranean. Soon, painted pottery of the same nature was being produced in Italy under the name of majolica. From there the craft spread to France and Holland. In Delft the Dutch workmen used the process to imitate the blue and white Chinese porcelain which was becoming more common in Europe. The manufacture of this ware was introduced into England from Holland by an Italian workman about 1570. By 1620 it was being produced by a group of potteries at Lambeth, and soon other English establishments were located at Bristol, Dublin, Liverpool, Wincanton, and Bridlington. Due to the high quality of the enamelled ware produced at Delft, pottery of this nature produced in northern Europe has come to bear the generic name Delft.

In the production of Delft pottery an earthenware form was first shaped from a mixture of clay and flint or other materials. This earthenware blank after baking resembled in colour and porosity a modern flower pot. The pot was then dipped into a watery suspension of finely ground tin enamel, which left after drying a coating of white powder. On this soft, dusty, non-adhering coat the design was painted; a thin transparent coat of lead glaze was applied by dipping or spraying, and the completed vessel was again fired. The vast majority of specimens of Lambeth Delft were painted in cobalt blue. More rarely yellow, green, turquoise and red pigments were employed. Sometimes the white ground exhibits a pinkish tinge, and most articles manufactured in Bristol have a very faint blue tint. In the author's collection of medical and pædiatric antiques are included specimens in English Delft pottery of caudle or posset pots, drug jars, ointment pots, bleeding bowls, feeding bottles, pill slabs and pap cookers.

Caudle pots.—The caudle pot (Fig. 1) was a receptacle peculiar to England which was common from the latter part of the 17th to the early 19th century. It had two handles and a cover, the spout arising from the lower part of the container. Its capacity varied from half a pint to two quarts. Caudles were used for the nourishment of the sick and ailing. Typical 18th century caudles were—white caudle, composed of oatmeal, spices, and white wine; brown caudle, of oatmeal, spices, ale, wine or brandy; tea caudle made from tea, eggs, wine and spices. Instructions for the making of oatmeal caudle, as contained in "The Compleat Housewife" by E. Smith, 10th edition, 1741, follow.

> "Take two quarts of ale and one of stale beer, add two quarts of water, mix them together, and add to it two handfuls of pot-oatmeal, twelve cloves, five or six blades of mace, and a nut-meg quartered or bruised; set it over the fire and let it boil half an hour, stirring all the while; then strain it out through a sieve, and put in near a pound of fine sugar, and a lot of lemon-peel; pour it into a pan, and cover it close, that it may not scum; warm it as you use it."

Some authorities use the term "posset pot" as being synonymous with "caudle pot". However, it would appear that the spouted containers illustrated above would be more suitable for the invalid's caudle than for the serving of posset.

Posset, while of somewhat similar composition, was used as a dessert, and was described by E. Moxon, 1778, as being as thick as custard, and E. Raffald, 1780, stated that it was to be served up with toast and butter upon a plate.

Drug jars.—The decorated Delft jars of the pharmacists served not only as actual containers for drugs but also assisted in dressing up and lending atmosphere to the shop, as do the present day large carboys which contain fluorescent liquids. Jars for dry drugs and ointments were cylindrical, while those destined for liquids were globular, spouted and handled, on a cone-shaped base. A few specimens of jars bearing painted dates have survived, and by comparison with these the time of manufacture of undated jars can quite often be determined. No collector of Delft pottery can afford to be without G. E. Howard's "Early English Drug Jars", published by the Medici Society, London, 1931, in which many dated Lambeth drug jars are magnificently illustrated.

In Fig. 2 are shown typical examples of pharmacy jars dating from 1660 to 1800. The first English drug jars inscribed with names of drugs were manufactured about 1650. Before this time uninscribed jars decorated in blue with rings or stripes had been produced. Jars with dates before the Great Fire of London in 1666 are very rare on account of the great destruction of such a high proportion of the wealthy pharmacists' shops at that time. From 1660 to 1700 an angel's head between outstretched wings was frequently incorporated in the decoration, while the birds, cherubs and cockle shells are usually marks of the 18th century specimen.

Ointment pots.—Examples of the small ointment dispensing jars of the 17th century are

* From the Department of Pædiatrics, University of Toronto, and Hospital for Sick Children, Toronto.

illustrated in Fig. 3. No. 1, an undecorated specimen, *circa* 1700, in pale robin's egg blue glaze, is a type frequently met with in various parts of London during excavations in the course of which long forgotten refuse deposits are uncovered. No. 2, *circa* 1640, is decorated in dappled brown on a greyish blue ground. No. 3 is extremely rare, in that the black colour is uncommon in Lambeth Delft, and, in addition, this jar, dating from the time of the Great Plague, is filled with the original ointment. An ointment is recorded as having been used during that epidemic, and judging from the small amount which has been removed from this container the remedy must have proved either extremely efficacious or utterly useless to its original owner. No. 4, found at Lambeth, decorated with blue streaks, and No. 5, a specimen from Westminster bearing a highly conventionalized blue flower, date from about 1700. While decorated specimens are rare, the plain pots can be obtained at such small cost that one is tempted to desecrate them by employing them as ash trays.

Pill slabs.—It is the opinion of Howard that the apothecaries' pill slabs, Nos. 1 and 3 in Fig. 4, were hung up inside the dealers' windows, partly as ornaments and partly as a sign that the owner was a member of the Apothecaries' Company. He bases this conclusion upon the unsuitability of the shield shape for the compounding of pills, and the fact that they rarely bear the scratches which would be produced by their continued use in the thorough mixing of

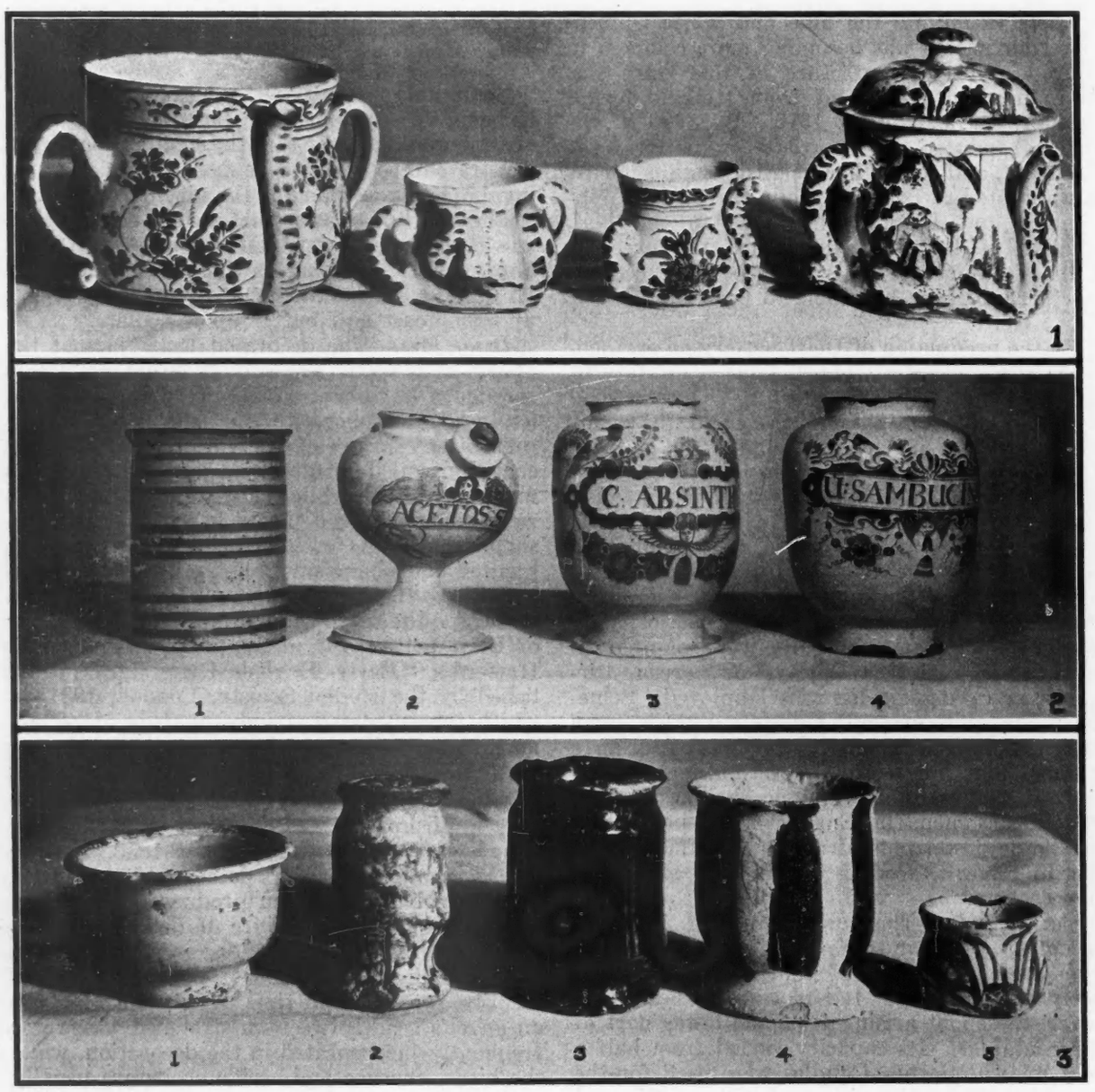
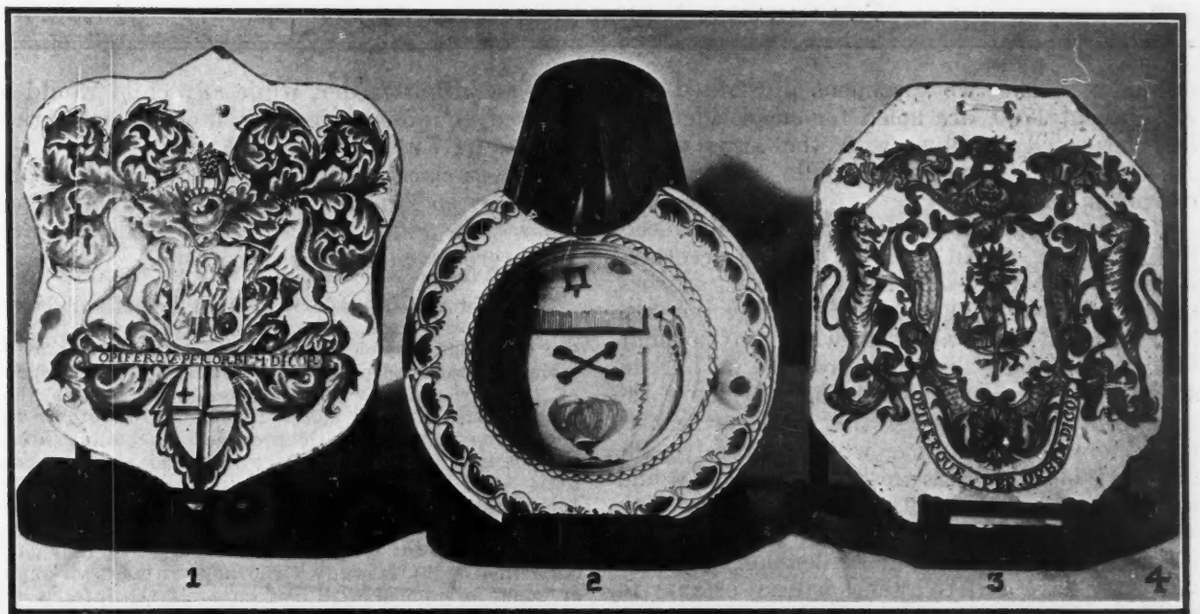


Fig. 1.—18th century caudle pots. **Fig. 2.**—Drug jars. No. 1, *circa* 1660. No. 2, *circa* 1680. Nos. 3 and 4, early 18th century. **Fig. 3.**—Ointment pots No. 1, *circa* 1700. No. 2, *circa* 1640. No. 3, *circa* 1660. Nos. 4 and 5, *circa* 1700.



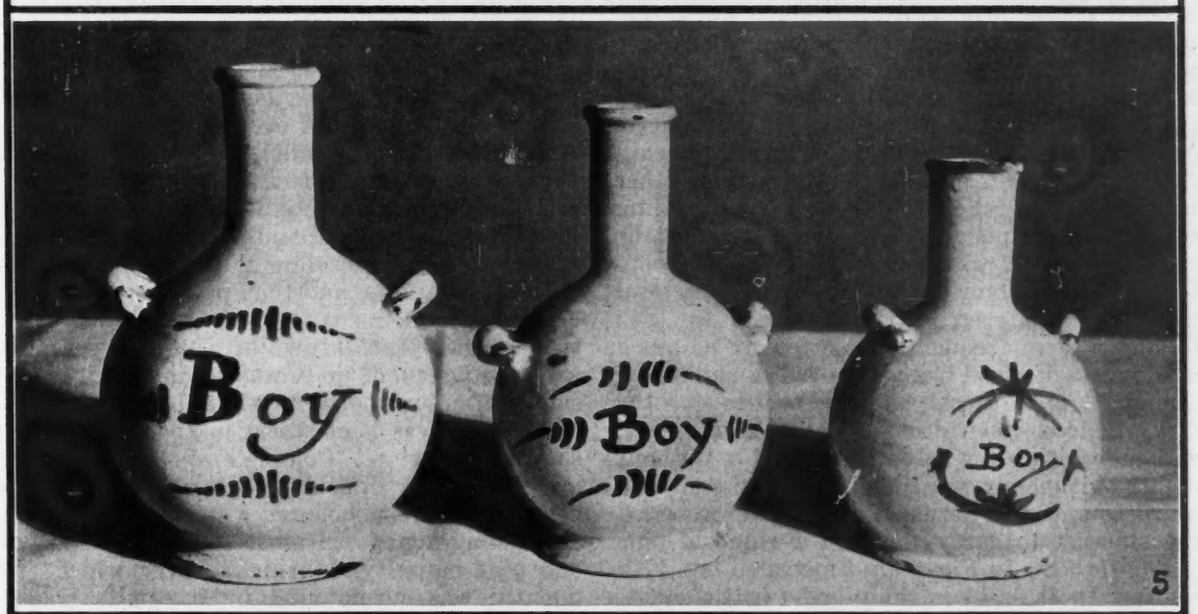




Fig. 4.—Nos. 1 and 3, pill slabs. No. 2, barber-surgeon's bleeding-bowl, *circa* 1700. **Fig. 5.**—Boy flasks, *circa* 1700. **Fig. 6.**—Pap warmers, *circa* 1750.

ointments. The two specimens illustrated date from about 1700, are holed for suspension, and are decorated in blue, with the arms of the Apothecaries' Company, Apollo slaying the dragon of disease.

Barber-surgeon's bleeding bowl.—The bleeding bowl, Fig. 4, No. 2, *circa* 1700, is decorated not only with representations of razor, scissors, brush and comb used in hair dressing but also bears crossed bones and somewhat conventionalized lancets. In his dual position of barber-surgeon its owner would fit the gap about the neck beneath the chin if the customer was to be lathered for shaving, while to receive the blood, if bleeding was desired, the arm would be fitted snugly into the gap. In the 18th century bleeding was employed in practically all illnesses and at all ages. Sydenham wrote in 1722, "I have ordered the smallest infants to be bled in the arm, and have taken away that quantity of blood which their age and strength indicated, with very great success. Nor is there any reason why one should wonder that I bleed young children, since from what I have hitherto observ'd it may be as safely perform'd in children as in grown persons. For by what other means can we relieve those that are breeding teeth from convulsions. I pass by at present the wonderful relief which bleeding gives in Hooping Cough, wherein it far surpasses all pectoral medicines whatever." Even as late as 1842 bleedings were frequently resorted to, as much as 8 ounces of blood being removed in childhood, though, "As a general rule it is well to stop the flow of blood when decided pallor takes place, without waiting for actual fainting." Without doubt, our ancestors if they had the constitution to withstand the perils of childhood possessed the stamina to carry them to a ripe old age.

Boy flasks.—In Fig. 5 are illustrated late 17th century Delft flasks in the pilgrim bottle shape, decorated with the word "boy". Boats for the feeding of pap have been described bearing the same word and without doubt these flasks were purchased as a "present for a good boy". By the use of a holed cork these might be converted into an infant feeder, while any child would be pleased to possess feeding utensils earmarked for his own use.

Pap warmers.—Pap was a thick feeding prepared by cooking flour or bread in water, sometimes with added milk. Details of its preparation were given by Raulin in 1769.

> "Good pap is made with light bread well baked and well fermented. The leaven divides and reduces the tenacious particles of the flour. The fermentation which it produces in the paste disengages a large part of the air which was held there. It is this that renders pap so made more proper than all others for nourishing infants. It is prepared by boiling bread broken into morcels in water into which one puts a little oil or butter, following the usage of the country. It is reduced over a gentle fire to the consistency of a jelly or of a light panada. The bread ought not to be freshly baked; it is better when three or four days old. One ought to smooth the pap with brown sugar or honey or indeed with loaf sugar if the infants are threatened with diarrhœa."

Pap was not only used in infant feeding to supplement breast milk, but was frequently employed as the sole food even from birth, when a wet nurse was not available. Hugh Smith, in 1767, wrote against the method of feeding usually employed, "Surely it is wrong to put a large boat full of pap into their little mouths, suffering them to swallow the whole of it in the space of a minute, and then perhaps, from their cries, to ply them with a second, which is no sooner down than thrown up again." As much as two quarts of pap was crammed into the small infant in the twenty-four hours.

The pap was kept warm in the pap warmer shown in Fig. 6. Complete specimens, which are exceedingly difficult to obtain, consisted of a base, which accommodated a small alcohol lamp, supporting a pap container of from one-half to one pint capacity, bearing a cover which frequently was surmounted by a candle holder. These pap warmers were also spoken of as "lazy nurses". Without doubt, attempts to rear infants from birth on milkless bread and sugar paps had much to do with the high infant mortality during the 18th century.

VAGINAL TAMPONAGE FOR CATAMENIAL SANITARY PROTECTION.—Lloyd Arnold and Marie Hagele determined the efficiency of tampons in collecting the catamenial discharge of ninety-five normal women. Three different makes of tampons were purchased and used in the experiments. Tampons A and C increased in size when placed in fluid in an unconfined space. Tampon B retained its original size under the same conditions. The subjects included housewives, clerks, factory workers, laboratory technicians, nurses, physicians, artists and business executives; the ages varied from 18 to 46 years. The degree or relative efficiency of the tampons was determined by grouping the amounts of catamenial discharge, in grams, absorbed by the protecting sanitary pads; that is, the amounts of exudate which passed the inserted tampons. Tamponage has been advocated and advised for protection during the last part of the period. Eight women did not need the protecting pad, since tampons afforded complete protection. Eighty-seven (91.6 per cent) needed more protection than was provided by any of the three types of tampons used. Seventy-seven (81.1 per cent) women could have used tampons alone during the last part of their period.—*J. Am. M. Ass.*, 1938, **110:** 790.

Association Notes

WHY SHOULD I BELONG TO THE CANADIAN MEDICAL ASSOCIATION?

Approximately four thousand Canadian doctors have satisfied themselves with the answers to the foregoing question, resulting in their becoming members of the Canadian Medical Association. There are several thousand others in Canada to whom the question has not been a matter of any concern or who have not as yet been sufficiently impressed with the answers to prompt them to become members. The purpose of this article is to set forth facts which it is hoped will result in bringing many recruits into our organization.

What is the Canadion Medical Association?

In 1867, the year of Confederation, a national charter was granted to a small group of practitioners—men of vision—who believed that the medical profession of this new Dominion could best serve the interests of the public and themselves by building a strong national association. The founders of the Canadian Medical Association believed that medicine was facing in 1867 and would face in all the years that might follow problems of education, legislation, public relations, and enlightenment that could only be dealt with properly by national unity within the profession. How little did our founders realize the complexion and the complexity of some of the issues which face us today, and yet in those days they did realize that without organization the medical profession could not hope to mould and direct public opinion and public relations, official and otherwise.

The Canadian Medical Association was founded to help the doctors of Canada to be better doctors by maintaining their proper relation to all other members of the community; by disseminating all available knowledge to one another; by mutually supporting and protecting one another; by doing all and sundry those things which properly come under the purview of an organized group of medical practitioners. Every ethical practitioner in Canada was invited to join the Association—just as he (or she) is today—and membership carried with it responsibilities and privileges. For seventy-one years the Association has carried on, never once losing sight of its main objectives, but sometimes, as during the war years, facing difficulties which seemed almost insurmountable. Today the Association through its membership, Branches, and Divisions is a more closely knit organization than ever it was. Unless all signs fail the Association is here to stay. It is strong, but it should and can be much stronger. You, Mr. Non-Member, can help to make it stronger and therefore more useful to you and to all other doctors by becoming a member.

What has the Canadian Medical Association Done?

The Association has held sixty-eight scientific meetings across Canada, providing programs of merit and usefulness, and incidentally paving the way for the great multitude of scientific meetings which subsequently were developed within the Provincial and local Medical Associations, and which today constitute in a large measure the life-blood of medical organizations throughout the land.

For close upon thirty years the Association has published a monthly journal which is said by many to be worth more than the cost of annual membership. The *Journal* aims to reflect the best medical thought and opinion to be found in Canada in the whole range of medical problems. It should be found in every Canadian doctor's library.

During the period 1926-1932, inclusive, the Association spent $212,847.52 to send 2,156 postgraduate speakers to give 4,889 addresses to a total medical attendance of 161,210. This extramural program is without parallel in any country in the world. While it was in progress there was no part of our far-flung country which did not feel its benefit. Since 1932 the program, greatly curtailed, has been carried on by the Association. It is our hope that when economic conditions again reach a more normal level it will be found possible to resume the plan on its former scale. Meanwhile, the profession of Canada is under a great debt of gratitude to our benefactors, the Sun Life Assurance Company of Canada, who provided this huge sum of money for such a worthy purpose.

It would be impossible to overestimate the value to the people of Canada of the more than 700 hospitals in our country and, incidentally, to the doctors of Canada for whom these hospitals are their work shops. During the past 10 years the Association has spent in excess of $125,000.00 in carrying on a department whose sole purpose is to assist the hospitals with their problems in order that hospital service may constantly be improved. Again, we are indebted to the Sun Life Assurance Company of Canada for their magnificent cooperation in financing this work in its entirety.

Ten years ago the Association embarked upon

a program of public enlightenment, utilizing more than 300 Canadian newspapers to whom health articles have been sent, reaching an estimated weekly circulation of more than two million. To date, this service has cost approximately $55,000.00, every cent of which has been contributed by the Canadian Life Insurance Officers' Association, to whom, again, we are greatly indebted.

Since 1926 we have received and spent gift funds totalling in amount slightly less than $400,000.00. During the same period our total membership fees would not amount to $400,000.00. Or, put in other words, for the past 13 years outside interests have contributed to our coffers more dollars than we have put in ourselves. Surely there could be no finer testimony than this to the bona fides of our organization and the work it is trying to do. Mr. Non-Member, does this fact not suggest to you that the Canadian Medical Association is worthy of your interest and support?

The Association is constantly informed on all legislative problems which affect it. An active legislative committee presided over by one of our members who is a member of Parliament keeps us in touch with all federal legislation in which the medical profession is interested. We have established and enjoy close cooperation with Federal departments (notably the Department of Health), and from time to time carry on joint activities, such as the publication of a book on periodic health examinations, while at the time of writing a joint committee is working on a book on Poliomyelitis.

During recent years there has been a growing necessity to study medico-economic problems, particularly as the subject of Health Insurance has become of increasing interest and importance in the public mind. The Association has endeavoured to keep itself well informed on the subject and for years back has been gathering data and information so that at any time and in any place it is ready with advice if called upon. Moreover, when the problem presented a real issue in the Province of British Columbia the Association upon invitation extended to that Province all possible support. What concerns the doctors of one Province today may be a matter of equal concern in another Province tomorrow. The Canadian Medical Association considers it to be a responsibility of a national organization to render to any and all of its component parts such help as it may. Surely this phase of economic security and safety should call for a united medical profession. It may affect you, Mr. Non-Member, just as much as it will a member.

During the past year a Royal Commission on Dominion Provincial Relations has been making an exhaustive inquiry throughout Canada hoping no doubt to find a solution to the many financial, political, economic and social ills under which our people think they are suffering. Believing that a useful purpose would be served, the Canadian Medical Association instructed its General Secretary to hold a watching brief at all sessions of the Commission as it moved across Canada. Moreover the Association submitted its own brief to the Commission, setting forth what it believed were guiding principles to be observed in attempting to arrive at a most efficient health policy for Canada. This is further evidence of the keen desire of the Association to endeavour to keep in close touch with all that is going on in Canada which may have a bearing upon the interests of our profession. Of course, members and non-members share alike any benefits which may accrue.

The Association maintains an active Committee on Pharmacy whose duty it is to watch all legislation arising in the field of therapeutics, to concern itself with the purification of drugs, patent medicine laws, and the like. The Committee performs a useful service to all practitioners.

Canada loses too many mothers in childbirth every year—far more (by percentage) than does our sister Dominion of New Zealand. In order to study this all important problem more thoroughly our Committee on Maternal Welfare recommended that a pregnancy survey which originated in Manitoba should receive the moral and financial support of the Association. The plan contemplates that for a period of two years every case of pregnancy arising within the Province shall be reported and recorded in minutest detail. This means a lot of work on the part of the practitioners of Manitoba, the value of whose efforts will be of interest and enlightenment to all the practitioners of Canada. The Association was pleased to vote $2,000.00 towards the cost of this survey.

Fourteen years ago the Association convened a Conference on the Medical Services in Canada, which was held in Ottawa under the auspices of the Honourable Minister of Health for Canada, and to which were invited representatives from all parts of Canada and from the many organizations, official and voluntary, concerned with the problem of health. Twice since, similar conferences have been held, and other conferences will follow for the purpose of bringing together all available viewpoints and opinions on Canada's most important problem—the health of her people. The Association believes that in taking the initiative in such conferences it is fulfilling to some degree at least one of its most important functions.

In 1920 a resolution originating in the Province of Saskatchewan urged the Association to take steps to organize a College of Physicians and Surgeons in Canada in order that those who by virtue of their education and training were entitled to be regarded as specialists might be so recognized by a Canadian institution. After ten years of careful planning and hard work on the part of the various Committees having the matter in hand the Royal College of Physicians and Surgeons of Canada came into being. There

are many who believe that the College will in the future play a very important part in the life of the medical profession of Canada, and the Association has every right to be proud of its offspring.

If you pay any Federal income tax you are indebted to the Association each year for a sum in excess of the annual fee. Why so? Because several years ago the Association conferred with the Commissioner of Income Tax and worked out on paper rules and regulations governing medical practitioners' returns. Copies were sent to every registered medical practitioner in Canada. Increased abatements which were permitted for mileage, depreciation of books and instruments, medical society fees, etc., etc., amounted to a sum upon which the minimum tax would have been higher than $10.00. Surely this is tangible evidence of the value of a national medical organization. This fact alone should answer the question "What do I get for my ten dollars or eight dollars?"

Canada loses by death from cancer approximately 12,000 persons a year. The Canadian Medical Association believes that a concerted attempt should be made to cut down this mortality by utilizing in every possible way such means as are at hand. During the past year the Association received from the trustees of the King George V Silver Jubilee Cancer Fund for Canada a grant of $14,000.00 to be spent in carrying out a national cancer program. A board of directors representing every Province in Canada was appointed and has met, with 100 per cent of the members being present. Active committees have been set up to carry out programs of study, education and publicity. It is proposed to organize cancer study groups in all hospitals with 100 beds and over (and in smaller hospitals whose staffs are desirous of organizing such study groups) for the purpose of securing as much data as possible dealing with this national menace.

By way of education, the Department has recently issued to the doctors of Canada, 10,500 copies of a Handbook on Cancer which deals with the subject in a very practical way and in such form and style as to make conveniently available reference to cancer in all sites of the body. This entire program has been made possible because we are a nationally organized body enjoying the confidence and support of the people of Canada, such as are represented by the trustees of the King George V Fund. Complementary to the development within our own organization of a Cancer Department the Association took steps to bring about the formation of the Canadian Society for the Control of Cancer. In March of this year the Society was granted a national charter. Branches have been established in every province, a Grand Council of eighteen persons—one layman and one doctor from each province—has been set up to govern the Society and this Grand Council met in Toronto on November 1, 1938, all but one member being present.

The Canadian Society for the Control of Cancer proposes to carry on a program of public education similar to that engaged in by cancer societies in many other nations. The Society can and will be an excellent auxiliary in the cancer field. The Association is pleased indeed to have had the privilege of bringing it into being.

Our medical service bureau has served more than 1,000 doctors looking for locations, *loca tenentes*, etc. Again this is a practical piece of service which is available to all members with, of course, no additional fees attached.

Every year the Association has approximately twenty committees—representing all sections of Canada—at work upon problems of vital interest to the medical profession.

During the past four years the Committee on Constitution and By-Laws has been engaged with the revision of our Constitution and By-Laws in order that a closer relationship might be established between the nine Provincial Medical Associations and the Canadian Medical Association. At this date it is indeed most gratifying to be able to report that seven of the nine provinces have completed federation with the Canadian Medical Association by becoming Divisions. It is confidently anticipated that ere long the two remaining provinces, Manitoba and New Brunswick, will have taken similar steps bringing about a national organization so completely coordinated that in every field of activity and in every part of Canada the medical profession will stand as a unit. In these days of change, flux and surprises who can overestimate the value to our profession of being organized on such a thorough basis?

There is no field of endeavour, interest or contact concerning our profession in which the Association is not prepared to enter intelligently and effectively. Surely this thought should give comfort and assurance to the profession and should demand the undivided and complete allegiance of the profession.

Seventeen years ago the Association was $18,000.00 in debt with practically no assets and was facing its future with misgivings and uncertainty. Today the Association has $85,000.00 and no liabilities. It faces the future with complete confidence and assurance that it is here to stay and endure, because it has proved itself worthy of the support both of its members and of the public, not forgetting that influential section of the public who have manifested their confidence by giving us more than $400,000.00.

But lest we should appear to be boastful, may we hasten to say—We are not strong enough. We never shall be until we can count in our ranks every honest medical practitioner in Canada.

Need we say more. Every medical graduate owes an "honour debt" to his medical forbears and to posterity. In fairness to yourself, to your colleagues, to those to whom you owe much for what is past, and to those who will come after you and for whom you would desire to make brighter the way—may we express the hope that

you will find no difficulty in answering the question, "Why should I belong to the Canadian Medical Association?"

Might we suggest to non-members that you complete your answer by making application for membership, on your own letterhead, to the Secretary of your Provincial Medical Association or to the General Secretary of the Canadian Medical Association at 184 College Street, Toronto.

T. H. LEGGETT,
Chairman of General Council.
T. C. ROUTLEY,
General Secretary.

MEETING OF THE EXECUTIVE COMMITTEE

The Executive Committee met in the Chateau Laurier, Ottawa, on October 27 and 28, 1938, with 100 per cent attendance.

FEDERATION

The following provinces submitted copies of their Constitution and By-Laws and other relevant documents, indicating that Federation in each instance had been completed, the respective Associations now having the right to be known by the name, Canadian Medical Association (name of province) Division:—British Columbia, Saskatchewan, Ontario, Prince Edward Island, Nova Scotia.

Manitoba reported that the Provincial Association had not seen fit to apply for divisional status this year. A similar statement was received from New Brunswick. It was agreed that the Committee on Constitution and By-Laws should continue further studies on the problem, with these two Provinces, during the coming year.

CODE OF ETHICS

It was decided to print the Code of Ethics as a separate publication, in order that it may be available to senior medical students, interns and others outside our own membership. When ready the new Constitution and By-Laws together with the Code of Ethics will be published in booklet form for distribution to all members.

MEMBERSHIP DRIVE

Acting upon a suggestion made by Saskatchewan, it was decided that the December issue of the *Journal* would be sent to a large number of non-members of the Association in the hope that many of the recipients will be prompted thereby to become members of the Association. For the year 1939, in all those provinces where we have Divisions, the annual fee will be collected along with the fee of the Division. This means that in only two provinces, namely, Manitoba and New Brunswick, will we be collecting our fee directly.

CANCER

The Committee learned with satisfaction of the development within the Association of an active Department of Cancer Control and also of the granting of a Charter to the Canadian Society for the Control of Cancer. Reference to both these developments will be found elsewhere in the *Journal.*

BLACKADER LIBRARY FUND

The announcement was received with pleasure of the bequest of $1,200 to the Library Fund of the Department of Hospital Service of the Association, a gift from the late Mrs. Blackader in memory of Dr. A. D. Blackader who, during his lifetime held the positions of President of the Association and Editor of the *Journal.*

TREASURER'S INTERIM REPORT

The Honorary Treasurer indicated that the estimated receipts for the year were somewhere in the neighbourhood of $76,000 with disbursements of $73,000, providing a surplus balance of $3,000.

THE MONTREAL MEETING

Both the Central Program Committee and the Local Committee in Montreal report excellent progress in connection with arrangements for the seventieth annual meeting to be held in Montreal during the week of June 19, 1939. The Windsor Hotel has been chosen as headquarters, and both general sessions and sectional meetings will be held there.

MEDICAL ECONOMICS

After a prolonged discussion it was agreed to instruct the Committee on Economics to make a thorough canvass of the Provincial Medical Associations to ascertain whether or not, in the opinion of these Associations, the Canadian Medical Association should define a policy for or against health insurance, having regard to the studies which have been made during the past several years by the Committee on Economics. It is hoped that this question will be gone into fully in each Provincial Medical Association.

PREGNANCY SURVEY IN MANITOBA

The Committee reported progress in connection with the pregnancy survey being made in Manitoba, to which survey the Association has made a grant of $2,000.

COMMITTEE ON NUTRITION

The Committee reported that during the past year three prominent speakers, namely, Prof. E. V. McCollum, of Johns Hopkins Hospital, Baltimore, Prof. L. H. Newburgh, of Ann Arbor, Mich., and Sir Edward Mellanby, of London, England, had presented public addresses on the subject of Nutrition in the cities of Ottawa,

Winnipeg, Calgary, Vancouver, Kingston, London, Montreal and Toronto. The Committee has under development plans for other speakers to appear later in other parts of Canada.

SENIOR MEMBERS

Ten senior members, who must have attained the age of seventy and who have been in continuous membership for a period of ten years immediately preceding their election to senior membership, may be elected by General Council in any one year. The provinces are requested to submit their nominations to the Executive Committee at its spring meeting (March) in order that those who may be elected for senior membership may be invited to come to the next annual meeting to receive the honour in person.

FOREIGN-BORN DOCTORS AND STUDENTS

It was the feeling of the Committee that Canada does not need to import doctors from foreign lands, in as much as our medical schools are producing quite as many doctors as the country can reasonably absorb. This question will be taken up with the proper authorities.

SECTION OF MILITARY MEDICINE

The Section of Military Medicine strongly urged that a complete survey be made of the medical profession of Canada in order that, in time of national emergency, proper advice might be given as to the distribution of the medical profession both for service abroad and at home. This matter will be discussed with the proper authorities.

DEPARTMENT OF HOSPITAL SERVICE

In presenting the report of this Department, Dr. Harvey Agnew reported the work of the Committee on Approval for Internship, and commented on the efforts being made by graduates of unapproved or unrecognized medical schools in the United states to obtain training in Canadian hospitals. Dr. Agnew was requested to report on the increasing shortage of interns, particularly in non-teaching hospitals away from teaching centres. In view of the desirability of having closer cooperation in the development of graduate medical education, including the specialties, Dr. Agnew was authorized to ascertain if the medical colleges, the Medical Council of Canada, the provincial licensing bodies, the Royal College of Physicians and Surgeons of Canada and the Canadian Hospital Council would be interested in forming a joint committee for this purpose.

The Associate Secretary reported a revision of the list of residencies in Canada and of the Outline of Staff Rules and Regulations. Other activities, some in conjunction with hospital or other associations, included the development of training courses for administrators, lectures on hospital relationships to senior medical students, outlines of tuberculosis and psychiatric care in general hospitals, a code of ethics for hospital administrators, and the principles of relationship between the medical profession and the hospitals.

Several members of the Executive Committee expressed warm commendation of the work of the Department of Hospital Service.

POST-GRADUATE EDUCATION

The Association is endeavouring to carry on, in a very modified way, the post-graduate lectures instituted a number of years ago. It is hoped that when financial conditions return to a more satisfactory level it will be possible to resume the activities of this Department on a much larger scale.

TARIFF ON CANADIAN RADIUM

Instructions were issued that the proper Department of the Government be approached to secure if possible a reduction in the tariff on the importation of Canadian radium which has to be sent abroad for processing purposes.

CONCLUSION

A great many other matters of routine and general interest were dealt with many of which were passed to appropriate committees for study and report, thus completing a full two-day's program.

All of which is respectfully submitted.

T. C. ROUTLEY,
General Secretary.

DEPARTMENT OF CANCER CONTROL OF THE CANADIAN MEDICAL ASSOCIATION

The Board of Directors of the Department of Cancer Control of the Canadian Medical Association met in Toronto on October 31, 1938, with all members of the Board present. These are as follows:—Drs. T. C. Routley (*Chairman*); Harvey Agnew, Toronto; E. B. Alport, Regina; A. T. Bazin, Montreal; William Boyd, Toronto; G. Stewart Cameron, Peterborough; G. S. Fahrni, Winnipeg; N. H. Gosse, Halifax; Roscoe Graham, Toronto; R. I. Harris, Toronto; A. D. Kelly, Toronto; A. E. Macaulay, Saint John; J. S. McEachern, Calgary; W. H. McGuffin, Calgary; W. J. P. MacMillan, Charlottetown; A. Y. McNair, Vancouver; G. E. Richards, Toronto; C. C. Ross, Toronto; William Scott, Toronto; Geo. S. Young, Toronto.

During the past year the nucleus of the Board (those resident in Toronto) met together on many occasions, and, keeping in close touch by correspondence with the provincial members of the Board, have endeavoured to work out a cancer program which would appear to come within the orbit of the Association at this time. Your Board was of the opinion that the following activities should engage its attention:—(1) The organization of cancer-study groups in all hos-

pitals in Canada with 100 beds and over, and in smaller hospitals where the medical staffs desire such cancer-study groups to be organized. (2) Preparation and distribution to the medical profession of literature dealing with the subject of cancer. (3) Providing lectures on cancer subjects to organized medical societies. (4) Preparing suitable material for lectures on the subject of cancer by doctors, (*a*) to medical audiences and (*b*) to the public. (5) The preparation of literature on the subject of cancer for publication and distribution to the general public. (6) Co-operation with the Canadian Society for the Control of Cancer in every direction in which such cooperation appears to be in the interests of the two organizations.

This being the first full meeting of the Board, a most interesting and profitable day was spent in discussing our plans under the above headings.

CANCER STUDY GROUPS

The Board has given a great deal of time and thought in studying the establishment of the proposed Cancer Study Groups. A committee under the chairmanship of Dr. William A. Scott was appointed to consider what record forms should be used by these study groups and what might be hoped to be obtained from such records as would ultimately be forwarded to this Department. After reviewing a great many record forms now available the committee concluded that it would be impossible to draw up any standard form which could be recommended to be used by all the cancer-study groups which might be established throughout Canada. Much discussion took place on this point, the following resolution finally being unanimously adopted:—

"That this Board of Directors approve the principle of the formation of a central body concerned with cancer statistics; and that this Board instruct the Committee on Record Forms to outline the machinery and forms necessary to achieve this purpose and to report later to this Board for action; and that, in regard to the forms to be used by hospitals, clinics and study groups for scientific recording of details, this Board of Directors regards the provision of uniform history forms impracticable at the present time; but that this Board instructs the Committee on Record Forms to provide to any hospital clinic or study group, on application, (1) a criticism of their present forms if submitted; (2) advice as to the minimum data required for an adequate record; and (3) samples of forms now in use in established clinics."

The first part of this resolution applies to the records which each study group will be required to submit to the Department of Cancer Control of the Canadian Medical Association for study, and it is intended that this form shall be as brief as possible and standardized for general use by all study groups.

With regard to the second part of the resolution, it was obvious to the members of the Board, as it will be to the profession at large, that hospital record forms, history sheets, etc., are so different and so varied that it would be impossible for any one standard form to be set up by this Department which would be acceptable to all the hospitals of Canada.

It was agreed that, as soon as possible, the provincial members of the Board would take steps, if they have not already done so, to approach the 100-bed hospitals in their respective provinces, having in view the setting up of these study groups at the earliest possible date.

What is hoped to be gained by these hospital study groups? Dr. Scott's committee, having given this question much consideration, reported as follows:—

There are a few study groups in existence at the present time in some of the larger hospitals.

I. What has been learned by such study groups up to the present?

(*a*) Valuable information has been obtained regarding the diagnosis of cancer. Although the history and clinical findings will frequently make the diagnosis of cancer very probable, the fact remains that in the vast majority of cases such diagnosis is only established by means of biopsy. The relative value of excision biopsy and aspiration biopsy is a question yet to be settled. The necessity of meticulous care in uterine curettage for diagnosis has been emphasized. In this connection a negative diagnostic curettage done at some previous date does not eliminate the possibility of cancer at a subsequent date. This probably applies to cancer in other areas than the female genitalia.

(*b*) Certain facts have been established about the results of various forms of treatment. The small hospital must start with the acceptance of the methods that have been established by larger clinics over a period of years. Deviation from these established methods should only be pursued after the most careful consideration.

(*c*) The value of the proper supervision and control of therapeutic measures has been well demonstrated.

II. With the present methods of the treatment of cancer the great problem is the recognition of the disease in its early stages. In many clinics the percentage of early cases has not increased despite continued reiteration of the value of early diagnosis. The causes of this delay are attributable to both patient and doctor. In many instances the patient does not seek advice in spite of knowledge of the possibility of cancer. In others, the symptoms are treated without eliminating the possibility of malignant disease.

III. It appears to your Committee to have been established that the great majority of cancer cases should not be treated in small hospitals, but should be referred to properly equipped cancer clinics.

IV. The small hospital will likely have no contribution to make to general medical knowledge, but can serve a useful purpose in making available statistics regarding the early history of cancer patients.

V. The medical personnel of any hospital will learn much by the systematic study of all their cancer cases.

REPORT OF THE AUTHORSHIP COMMITTEE

Under the chairmanship of Dr. Roscoe Graham, the Authorship Committee has recently completed a most arduous task in the preparation and publication of a Handbook on Cancer, 10,500 copies of which have been printed for distribution to the medical profession of Canada. That the work of the Committee has been well done is apparent by the expressions of appreciation coming in from a great many quarters.

In discussing the work of this Committee it was the feeling of the Board that the Authorship Committee might now turn its attention to studying various reactions which come to its

attention as to the value of the book, having in mind future publications of a somewhat similar nature.

Furthermore, the Committee was requested to consider the question of the preparation of material for medical lectures, lectures by medical men to the public, and material for dissemination through the press to the general public.

FUTURE POLICY

A study committee under the chairmanship of Dr. Geo. S. Young presented an outline of the background of this Department, and further attempted to outline the future policy of the Department.

After dealing with various objectives referred to as coming under the purview of the Department some of which have been mentioned previously in this report, the balance of the report deals with the future policy of the Department, as follows:—

When the Department of Cancer Control was organized it was instructed in reference to certain "immediate" duties:—

1. To set up cancer-study groups in hospitals of 100 beds or over throughout Canada.
2. To give the physicians in Canada by direct communication and through the *Journal* the latest information about cancer.
3. To prepare addresses on cancer in order to assist doctors who are called upon to speak on the subject to lay audiences in the event of the organization of a National Society for the Control of Cancer.

The carrying out of these instructions required a great deal of preliminary work which obviously had to be done by a local nucleus of the Board of Directors of the Department of Cancer Control. The field was new and difficult problems had to be faced. For example, there has been considerable discussion and, until now, uncertainty as to the most suitable report forms to be used by study groups. A magnificent piece of work has been done by the Authorship Committee in compiling an up-to-date handbook on cancer. It is already being distributed and is available free of charge to every practising physician in Canada.

The National Society for the Control of Cancer has been organized, and very shortly physicians will be asked to address meetings composed largely of the laity. This will bring the Department of Cancer Control face to face with its third task, *viz.*, to provide authoritative material for the use of speakers. Up to the present this has been left in abeyance, but when the demand comes the Department of Cancer Control will have sufficient data to supply to speakers, unless, of course, it is decided to furnish them with ready-made addresses.

OBJECTIVES

The Department of Cancer Control has been set up by the Canadian Medical Association to focus the attention of physicians throughout Canada on the cancer problem, to concentrate their efforts in the endeavour to bring about a better control of the disease and to take whatever part is required in the education of the public. It would seem that for the present at least these objectives are well covered in the "immediate" duties imposed on the Department of Cancer Control. There is another possible activity which is worthy of consideration, *viz.*, the enlistment of physicians outside of the hospital study groups in what might be called "Previous History Research".

PREVIOUS HISTORY RESEARCH

All organization, no matter how carefully planned, will fail to reach its objectives unless it has not merely the passive interest but rather the enthusiastic cooperation of its members at large. As a result of the activities already planned by the Department of Cancer Control the doctor may read more about the disease; he may become more alert as to the need for careful examination, early diagnosis and effective treatment; he may become more impressed with the importance of educating his patient as to the value of periodic health examinations and of the apparently trivial signs suggestive of cancer. But if he can be invited to work on a problem in clinical research, for which every practising physician is qualified, there is a fair chance of getting his active, personal interest. Whether such research would be of value might be open to question, even if the results were collected by the Department of Cancer Control and carefully studied, but undoubtedly the time has come for investigation of the antecedents of cancer. What is wanted is an accurate and minute detail of the family and personal history of all cancer patients. Scientific research now and in the past has concerned itself with the study of the nature of cancer and the effect of treatment. Cancer has been produced experimentally by various agents and some of these are known to cause the disease in human beings. But the belief is now expressed by those engaged in scientific research that there are other remote factors which may be active for years before the final transformation of the body cell into one which is malignant. It has been urged that the time has come to follow back in the history in the hope of finding out more about these remote factors; in other words to look for ways of preventing cancer.

A. HOSPITAL GROUP STUDY

The following procedure is suggested:—

1. The local study and tabulation of results to be carried out under the direction of a sub-committee on hospital group study. This would enlarge the duties of the present committee so as to include operation as well as organization of the study groups. Its activities would necessitate the following steps in which it would require the *cooperation of the central office and the chairman of the provincial cancer committees:*—

(*a*) Calling a meeting of each hospital study group *for organization* and address by some one qualified to explain the plan of study, the way in which data must be recorded and their final disposition. For this the *provincial representative on the Board of Directors should be responsible.*

(*b*) The transmission of the data at stated intervals to the central office for *analysis and report to the Board of Directors.* The responsibility here should rest on each study group and the central office.

It would then be the duty of the Board of Directors to give whatever medical publicity it saw fit to the results obtained.

The success of the whole scheme depends on maintaining the interest of the groups and even their solidarity. It would therefore be advisable to encourage groups *to invite qualified outsiders to address them from time to time* on various aspects of the cancer problem. Here again the responsibility might rest on the provincial chairmen.

It is quite possible that the staffs of some hospitals of less than 100 beds may desire to organize cancer study groups. Again, there are actually cancer study groups at work now in Prince Edward Island, Manitoba, Alberta, British Columbia and perhaps in other provinces. In both these cases your Sub-Committee would recommend that, while adhering in principle to the 100-bed limit, the Department should sponsor or assist if requested.

B. MEDICAL PUBLICITY

In addition to what has already been mentioned, and this includes the most difficult and arduous task of producing an authoritative book on cancer, there are two other fields of activity.

1. Provision should be made for *addresses* and *clinics* for larger groups of doctors who attend local, District, Provincial and Dominion medical meetings.

It is recommended that the *Managing Director of the Department of Cancer Control* be instructed to approach (personally if possible) the various Provincial Associations and the Canadian Medical Association with the request that they define their policy on the question of including in their scientific programs, whether relating to Dominion, Provincial, District or local society meetings, the subject of cancer.

2. It is suggested that the Department of Cancer Control should endeavour to secure a *single column of each issue of the Journal for material on cancer*. This might include news of the activities of this Department, of the Canadian Society for the Control of Cancer, items of interest in regard to movement in the cancer field in other countries, information as to recent results of scientific research and reference (perhaps only by name) to important new articles and books.

C. Lay Publicity

The original instructions to the Department of Cancer Control placed on the Authorship Committee the duty of preparing "a number of addresses suitable for delivery before a lay audience". This would insure against inaccuracy of statement, but it has certain disadvantages. It is not easy for anybody but a practised speaker to hold the attention of an audience when he reads his speech. He loses his individuality when he reads an address prepared by somebody else. The average man does not care to pretend that he is delivering his own speech when he knows it is not his own, and if the audience is aware of the situation so much the worse. It would seem better not to interpret the original instructions too literally, but rather to instruct the Authorship Committee and the Canadian Medical Association Office to supply on request accurate data to the provincial members of this Board.

Should the Department of Cancer Control take any initiative in the education of the public through literature or public addresses? It would seem best to leave the initiative in this matter to the Canadian Society for the Control of Cancer, with the understanding that the Department of Cancer Control will be glad to use all its available resources in supplying speakers when requested.

In this connection your Committee would recommend that the Department of Cancer Control re-affirm its desire to cooperate in every possible way with the Canadian Society for the Control of Cancer, and that this resolution be officially presented at the coming meeting of the Grand Council.

After a lengthy discussion in which nearly all members of the Board took part, this report received unanimous approval.

Centralization of the Treatment of Cancer

Dr. G. E. Richards presented to the Board a lengthy report dealing with the question of what he believed to be the necessity of greater centralization of the treatment of cancer. This report was referred to the members of the Board for careful study. It will be dealt with at the next meeting.

Cancer a Reportable Disease

In some of the provinces of Canada cancer is now a reportable disease. The opinion was expressed that a similar regulation should pertain in every province. The Department is inviting the Executive Committee of the Canadian Medical Association to study this matter and take such action as it sees fit.

Perusal of the report will disclose that there is a certain amount of overlapping in the presentation. However, as it details the deliberations of the first full Board meeting and as the subject is of much importance to all Canadian practitioners, it would seem that to tell the whole story, and perhaps some of it twice, would not be amiss.

It was the unanimous opinion of the members of the Board that a very useful purpose had been served in coming together, and a very happy, and we trust profitable, day was brought to a close by a dinner party at the University Club when the Toronto members of the Board had the privilege of extending hospitality to their colleagues from the nine provinces.

All of which is respectfully submitted.

T. C. Routley,
Chairman.

THE CANADIAN MEDICAL ASSOCIATION—ALBERTA DIVISION

The third annual meeting of the Canadian Medical Association, Alberta Division, was held at the Palliser Hotel, Calgary, on September 12, 13 and 14, 1938. With midsummer-like weather and the harvesting of splendid crops in this Province physicians from country districts felt that they could afford to travel considerable distances to attend this meeting. Hence it was that we had the largest attendance in the history of our association in a period of thirty-two years. We were fortunate in having such a number of notable speakers from Canada and the United States, including Dr. L. H. Newburgh, Professor of Clinical Investigation, Ann Arbor, Michigan: Dr. M. S. Henderson, Chief of the Department of Orthopædic Surgery, Mayo Clinic, and representatives from the Canadian Medical Association, Dr. Kenneth MacKenzie, President of this Association; Dr. A. T. Bazin, Montreal; Dr. T. C. Routley, General Secretary of the Canadian Medical Association; also Dr. Charles Hunter, Professor of Medicine and Dr. W. A. Gardner, Professor of Orthopædic Surgery, both of Manitoba University, and Dr. Howard Spohn, pædiatrician, Vancouver.

Prof. L. H. Newburgh gave two addresses, one, on "A new interpretation of diabetes mellitus in middle-aged obese persons" and another on "The nature and treatment of nephritic œdema". Dr. M. S. Henderson also gave two addresses, one on "Review bringing up to date the treatment of old fractures of the neck of the femur". Dr. Kenneth MacKenzie discussed, "Paroxysmal tachycardia" and "The treatment of hypertension", and Dr. A. T. Bazin, "Cancer of the breast" and "Cancer of the rectum and colon". Dr. Charles Hunter gave two addresses on "Common errors in medical diagnosis" and "Common errors in medical treatment", and Dr. W. A. Gardner, one on "Congenital de-

formities the general practitioner should recognize early and submit for treatment", and another on "Some causes of pain in the back and sciatica"; and Dr. Howard Spohn on "The physiology of conditioned nervous reflexes and its practical application in the treatment of various nervous states in children and adults", and "The recognition and treatment of thyroid disturbances in early childhood and adolescence". Dr. H. C. Dixon, of Medicine Hat, reported on "An unusual chylous cyst" probably due to a congenital defect, which was of much interest. Dr. Emma Johnstone, of Wandering River, 180 miles north of Edmonton, entered a plea for the establishment of a medical air service which would meet the needs of settlers in outlying districts in her paper on "Medical care of settlers in outlying districts".

Dr. Kenneth MacKenzie and Dr. T. C. Routley spoke at the noonday luncheons, and each reviewed the aims and objects of the Canadian Medical Association and the future of this organization. Dr. MacKenzie referred to the meeting of the Canadian Medical Association held in Halifax last June and what had been accomplished and to future plans for the advancement and unification of our profession. Dr. Routley stressed the need for a unified medical body in Canada, so that doctors could speak not only for themselves, but, for the profession throughout Canada. In reference to socialized medicine, he stated, "Don't shut your eyes to the fact that the movement with respect to some sort of socialized medicine is growing and gaining more momentum every year". He believed that it is essential the medical men should keep in touch with all such movements and study them carefully.

At a largely attended public meeting at Central United Church, Dr. A. T. Bazin gave an address on "Your cancer problem", and Dr. L. H. Newburgh gave one on facts which the public should know in regard to food values, and a proper estimate of diet. A film, "That man may live", was also shown.

At the annual banquet, Mr. A. L. Smith, K.C., was the guest speaker. He spoke of the need for some sort of socialized medicine in this country as a growing problem, accelerating each year gathering a greater following from all walks of life. He urged physicians to take a greater interest in public affairs, as "a doctor was the best candidate obtainable for public office, for, as the result of his close contact with his patients, the latter would follow him against their political prejudices".

At the Calgary Golf and Country Club the Kennedy Cup was competed for, the winning member being Dr. W. S. Nieuchas.

Entertainment was provided for the visiting ladies with afternoon tea in the Sun Room of the Palliser Hotel, also an afternoon tea at the home of Mrs. E. B. Roach. A dinner and bridge at the Renfrew Club and a luncheon at the Calgary Golf and Country Club completed the list of functions.

The following officers were elected for 1938-39: *President*, Dr. C. R. Bunn, Red Deer; *President-elect*, Dr. L. J. O'Brien, Grande Prairie; *Hon. Sec.-Treasurer*, Dr. George R. Johnson, Calgary; *Librarian*, Dr. Heber Jamieson, Edmonton. Chairmen of Committees: *Medical Education*, Dr. A. C. Rankin, Edmonton; *Finance*, Dr. George Johnson, Calgary; *Archives*, Dr. Heber Jamieson, Edmonton; *Public Health and Mental Hygiene*, Dr. A. C. McGugan, Ponoka; *Economics*, Dr. A. E. Archer, Lamont; *Pharmacy and Hospital Service*, Dr. I. R. Bell, Edmonton; *Cancer*, Dr. W. H. McGuffin, Calgary; *Maternal Welfare*, Dr. J. Ross Vant, Edmonton; *Editorial Board, Canadian Medical Association Journal*, Dr. George E. Learmonth; *On the Council of the Canadian Medical Association*, Drs. C. R. Bunn, George Johnson, J. K. Mulloy, R. B. Francis and T. R. Ross; *Executive Committee of the Canadian Medical Association*, Dr. H. E. Archer.

At the Board of Representatives Meeting held during the Annual Meeting of the Canadian Medical Association, Alberta Division, it was decided that the next annual meeting would be held in Edmonton and the executive officers were instructed to endeavour to cooperate with the Prairie Provinces and British Columbia in arranging for the 1939 annual meetings to be held consecutively, with speakers giving papers at all conventions.

The Board endorsed the refresher courses annually given in May by the staff of the University of Alberta and hoped that these would be continued.

A feeling was expressed that all examinations to satisfy claims against insurance companies should be paid by the insurance companies, from funds gathered for that purpose. The Committee on Economics recommended that a Standing Committee be appointed, composed of men who were willing to tackle the task, and that this Committee attend all district meetings at the expense of the Division. This was considered by the Board as financially impossible unless fees were considerably raised.

The question of amalgamating the Division with the College of Physicians and Surgeons was up for discussion, but on motion it was decided that no further action be taken.

THE CANADIAN MEDICAL ASSOCIATION—QUEBEC DIVISION

The First Annual Meeting of the Canadian Medical Association, Quebec Division, was held in the amphitheatre of the Montreal Neurological Institute on October 21, 1938, at 5 p.m. The President, Dr. A. T. Bazin, occupied the Chair.

1. *Retiring President's Address* (in part).

"Born of a desire to be more intimately and actively associated with the medical profession throughout the whole of Canada, and to participate in solving the problems, both scientific and economic, which constantly confront the profession, the Quebec Division was organized in August, 1937, and obtained its status at the meeting of the Executive Committee of the Canadian Medical Association, October 28, 1937. As proof of an allegiance which but lay dormant the following figures are quoted:—On January 1, 1938, there were but 384 members of the Canadian Medical Association in the Province of Quebec. There are now 537 and this without any intensive campaign for members.

"But accession of members is not the only criterion of success in organized medicine; there must also be an increasing interest on the part of the individual. This interest should demonstrate itself in a desire to give better medical service to the community, to emphasize the preventive side of medicine as well as the therapeutic, to oppose charlatanism by scientific as well as conscientious care, and to maintain the dignity and material well-being of the profession. We believe we can accomplish these ends best by tying in with nationally organized medicine. We do *not* believe that the other provinces of Canada should be considered foreign or alien, to be dealt with through a 'Committee of External Affairs'. It may be that there are problems which are unique to the Province of Quebec. From many years' experience with national medicine I do not believe that this province differs in that respect from any other of the provinces. I do feel, from that same experience, that cooperation and coordination, and not isolation, are of definite aid in helping to solve those problems.

"In the coming year I foresee the Quebec Division actively cooperating through standing and special committees, with all of the activities of the Canadian Medical Association."

Dr. Bazin then spoke in detail of the work of the Post-Graduate Committee and the Cancer Study Committee.

The Post-Graduate Committee.

"For years this department was handsomely subsidized, and I firmly believe this subsidy will be re-established in the near future. But in the meantime let us begin in a small way. Let us organize our district societies and supply speakers on various topics. This we did prior to the period of subsidy. Let us again do this work on a voluntary basis.

"Another suggestion worthy of consideration by the incoming Executive Committee is that of establishing an annual meeting with a scientific program. Care must be taken that such a meeting shall not interfere with other similar activities, notably, with the Annual Clinical Convention of the Montreal Medico-Chirurgical Society which is at this time demonstrating an increasing interest and importance. Rather, should the Annual Meeting of the Canadian Medical Association, Quebec Division, add to rather than detract from the attractions of this Convention".

He went on to say: "In conclusion, we recognize that in the Province of Quebec there is a large number of our colleagues who are not served directly by the Canadian Medical Association or its *Journal*. We appreciate the efforts they have made and are now making in the formation of a medical organization with the same aims and objects as ourselves. We wish them God-speed."

2. *Report of the Honorary Secretary* (in part).

"Before making the first annual report of the activities of the Canadian Medical Association, Quebec Division, it is fitting that a brief review of the events which led to its formation in October, 1937, be given.

"From 1922 to 1935 the Province of Quebec Medical Association was recognized by the Canadian Medical Association as a branch of the Association, and was represented on the General Council, but in 1935 its activities ceased, and, as a result, the members of the Canadian Medical Association resident in the Province of Quebec were without proper representation on the Council or Executive Committee of the Canadian Medical Association. It became obvious that those who desired to continue in affiliation with the Canadian Medical Association and to take part in its activities to mutual advantage must form a new body through which this franchise might be exercised. By means of a circular letter members of the Canadian Medical Association resident in the Province of Quebec were asked to signify their willingness to belong to this new provincial medical body, which, when formed, would become the Quebec Division of the Canadian Medical Association. The response was so encouraging that on October 13, 1937, a general meeting of those who had signified their willingness was called. The meeting was largely attended and included members of both the English and French profession. A constitution and by-laws were adopted, and officers and an executive committee were elected under the leadership of Dr. A. T. Bazin as president and Dr. F. S. Patch as chairman. The Executive Committee was then instructed to forward a petition to the Canadian Medical Association asking for status as the Quebec Division of the Association. This petition was granted by the Canadian Medical Association on October 28, 1937, the constitution and by-laws of the new organization were approved, and the Canadian Medical Association, Quebec Division, came into being."

Membership.—It is a pleasure to report that 96 per cent of those who were previously members of the Canadian Medical Association resident in the Province of Quebec have also become members of the Quebec Division; 179 new members have been obtained, and at the present time the Division has 8 senior and 529 active members.

Districts.—It is hoped the coming year will see the formation of one or more districts. Our by-laws allow members of the Division residing in one locality to apply to the Executive Committee to form a district, and each district may elect one representative to the Executive Committee of the Division.

The expenses of organization and the first year of operation have been heavy. Office space and secretarial assistance are shared with the Montreal Medico-Chirurgical Society, and this arrangement has proved very satisfactory. The composite fee for membership in the Canadian Medical Association and the Quebec Division is $10.00, $8.00 of which goes to the Canadian Medical Association, leaving $2.00 available for the expenses of the Division. The Honorary Treasurer's report will show that we have kept within our income and may expect to have a cash balance of about $100.00 at the end of the year. With a year of successful organization behind us, an increase in membership of over 40 per cent,

and our finances on a sound basis, we may look forward to an active year in 1939.

Rowell Royal Commission.—In November, 1937, the Quebec Division was requested to cooperate with the General Secretary of the Canadian Medical Association in the preparation of a memorandum dealing with the principles of federal and provincial responsibilities in relation to health, for submission to the Rowell Royal Commission. Through our Committee on Economics this Division forwarded to the Canadian Medical Association a brief setting forth its views.

Conference of Medical Secretaries.—The Secretary of the Quebec Division was invited to attend a conference of the secretaries of the nine Divisions and Provincial Associations during the week of the annual meeting of the Canadian Medical Association in June, 1938. The Association plans to make this conference an annual event for the discussion of problems of mutual interest."

A. W. YOUNG,
Honorary Secretary.

On motion by Dr. Mills, seconded by Dr. Gérin-Lajoie, the report of the Honorary Secretary was adopted.

3. Report of the Honorary Treasurer.

The financial report of the Division, which I have the honour to present, is this year only an interim report, inasmuch as the financial year of the Canadian Medical Association and the Quebec Division corresponds with the calendar year. The expenses of organization (clerical assistance, stationery and postage) which began in August, 1937, amounted to approximately $350.00, or nearly half of the total disbursements. In spite of the entire absorption of this unusual item during the first financial year of the Division, it is estimated that there will be a cash balance at the end of the year of about $100.00. Ninety-five per cent of the fees have been collected.

The condensed statement of receipts and disbursements from January 1 to September 30, 1938, is as follows.

Receipts		
Total net income from fees	$1,015.85	
Bank interest	5.49	
		$1,021.34
Disbursements		
Office rent, January to September, 1938	$135.00	
Clerical assistance, August, 1937, to September, 1938	340.00	
Postage	98.00	
Stationery and supplies	150.77	
Office equipment	38.66	
		762.43
Credit balance as at September 30, 1938		$258.91

E. S. MILLS,
Honorary Treasurer.

On motion by Dr. Mills, seconded by Dr. J. M. F. Malone, the report of the Honorary Treasurer was adopted.

4. Election of President.—The Chairman informed the meeting that Dr. W. W. Lynch had been elected President-elect in October, 1937, and on motion by Dr. J. C. Meakins, seconded by Dr. J. Stevenson, Dr. Lynch was confirmed in office as president.

5. Election of Officers and Executive Committee.

The following were duly nominated and elected:—*President-elect*, Dr. D. S. Lewis; *Chairman, Executive Committee*, Dr. F. S. Patch; *Honorary Secretary*, Dr. A. W. Young; *Honorary Treasurer*, Dr. E. S. Mills. *Executive Committee:* Montreal District, Dr. L. Gérin-Lajoie, Dr. J. C. Meakins, Dr. L. C. Montgomery; Quebec District, Dr. J. Stevenson, Dr. Arthur Vallée; Bedford District, Dr. G. F. L. Fuller, Cowansville; Huntingdon District, Dr. H. R. Clouston, Huntingdon; St. Maurice District, Dr. J. M. F. Malone, Three Rivers.

6. New Business.—Dr. Patch, Chairman of the Executive Committee, put two suggestions to the meeting: First, the inauguration of a series of post-graduate educational meetings in the various districts of the Division; and, second, the possibility of holding a scientific meeting at approximately the same time as the Montreal Medico-Chirurgical Society holds its Annual Clinical Convention. On motion seconded by Dr. J. C. Meakins and carried, it was approved that these two suggestions be referred to the incoming Executive Committee for consideration.

There being no further business the meeting adjourned at 5.45 p.m.

Forty-eight members were present.

A. W. YOUNG,
Honorary Secretary.

Hospital Service Department Notes

The Inclusion of Medical Care Proposed for Hospital-care Insurance

It has seemed inevitable that, sooner or later, there would be a request that the many plans now in operation of voluntary hospital-care insurance, frequently termed group-hospitalization, should be enlarged to provide also for the medical care of the members hospitalized. The numerous hospital plans now in operation have proved most beneficial to the members enrolled, and, in many instances, the satisfactorily low incidence of hospitalization has permitted an increase in the scope of the benefits provided. As anticipated, the medical staffs themselves have frequently sought inclusion of their fees in these arrangements. In New York City, where the plan will have passed the million mark before this appears in print, the demand for medical inclusion has been very insistent.

This movement became of widespread importance when it was formally introduced for approval in the newly-formed House of Delegates of the American Hospital Association at its Dallas, Texas, convention this autumn. It was pointed out that many people in the low-wage bracket cannot now join hospital service plans

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

because such would make them semi-private patients subject to a medical charge which they could not meet. Medical societies are now studying, and in some cases are preparing to sponsor, group-payment plans to cover medical fees for patients of limited means. "If these efforts are successful they will reclaim for private medical practice a segment of medical service in hospitals even larger than that which is protected by existing hospital-care insurance plans."

The hospital organization endorsed the viewpoint that efforts by the local medical profession to extend the voluntary insurance principle to medical fees in hospital practice could be assisted by cooperation with approved hospital-care insurance plans. The Association went on record as being prepared to approve periodic payment plans for hospital care and medical service in hospitals which are also approved by the local medical profession, and which conform to the following principles:—

1. Sponsorship and control by non-profit organizations, representative of hospitals, the medical profession, and the public.
2. Free choice of physician and free choice of hospital, consistent with existing relations between approved hospitals and their physicians.
3. Financial soundness and adequate accounting.
4. Equitable payments to physicians and to hospitals.
5. Separate finances and reserves for hospital care and for medical services of attending physicians.
6. Hospital and medical service benefits determined by hospitals and the local profession.
7. Dignified promotion and administration.

This action is of interest to Canadians because of the similarity of our plans here. In our mining areas in the east and in the west we have had parallel plans for medical and hospital care for years. In Ontario the medically-sponsored Associated Medical Services, Inc., has provided for both medical and hospital care with complete satisfaction to the medical men participating. The safeguards proposed by the American Hospital Association would seem very sound. Free choice of physician is stipulated, but such is not to go so far as to interfere with the staffing arrangements of any of the hospitals. Only those plans are to be considered which will have first met with the approval of the local medical society. That is a reasonable prerequisite. Moreover, as this is primarily a medical problem, the proposal is mainly that of cooperating through a joint committee with the American Medical Association in a study of these developments. As the American Medical Association at its epochal business meeting in September formally endorsed the principle of hospital-care insurance, the likelihood of evolving a basis of insurance acceptable to both bodies is infinitely more probable than before.

One foresees a possible complication as a result of extending the medical benefits only to cover patients in hospital. As doctors are only human, one can only anticipate an increased incidence in hospitalization if such action will bring to the doctor the financial benefits of the enlarged plan. To avoid this complication, it would seem reasonable, if the plans are to be enlarged, to enlarge them to cover all medical care, whether in or out of the hospital, as is now done in the Ontario plan. However, when this suggestion was made during the Dallas discussion, it was pointed out, and rightly so, that a hospital body as such has no right to sponsor plans extending beyond its rightful sphere of activity.

The Cancer Campaign

The Canadian Society for the Control of Cancer

The first annual meeting of the Grand Council of the Canadian Society for the Control of Cancer was held at the Royal York Hotel, Toronto, on November 1, 1938, with the President, Dr. J. S. McEachern, in the chair. The Grand Council of this newly formed Society, operating under a Federal Charter granted in March, 1938, is composed of 18 members, two from each of the nine provinces, one of whom is a medical practitioner and the other a layman. These councillors are elected annually by the members of the nine provincial Branches of the Society. In addition there is a Board of Directors composed of four medical men and three laymen.

The meeting was a most enthusiastic one and continued throughout the day. Out of a possible attendance of 25, there were 23 present, only one Councillor and one member of the Board of Directors being absent due to circumstances beyond their control.

Doctor McEachern, in delivering the first presidential address, stated that "An attempt to control the ravages of any menace presupposes some knowledge of the characteristics of it and a real determination to increase that knowledge. It presupposes something more—a determination to utilize every agency which will enable us to make full use of the knowledge of the moment and a readiness to make practical application of any new knowledge which becomes available. It follows that the particular activity arising from this determination may, and probably will, be, increased rather than lessened by enlargement of our knowledge." He paid fitting tribute to the research workers in medical experimental laboratories as well as to those in non-medical allied sciences, and also to the workers in the field of clinical medicine, clinical surgery, pathology and radiology.

Stressing the need for a nation-wide plan to organize the efforts to increase our knowledge of

cancer and to utilize effectively the knowledge which we possess, Doctor McEachern outlined the steps by which the Canadian Medical Association brought about the formation of this Society in 1938. Expressing the belief that one of the most urgent needs at the present time is a dissemination of knowledge to the public in order that people may recognize the warning signs and symptoms of early cancer and precancerous lesions, and know what can be accomplished in the way of a cure in the early stages of the disease, he also pointed out many other methods by which the Society could help in combating the mortality due to this disease.

Provincial reports.—The councillors from all provinces reported for the provincial Branches. The nine Branches are now organized, albeit not all to the same degree. British Columbia probably has advanced farther than most, with some 31 units set up and approximately 1,000 active members. The other provinces reported satisfactory progress, and there was a general feeling that although each Branch faced a big task no effort would be spared to deal with this national problem.

Publicity.—The question of publicity received serious consideration. Through the courtesy of the Canadian Medical Association medical speakers for public meetings or for smaller groups of interested laymen will be provided.

Plans for a bulletin to go to all members at regular intervals were considered and the value of pamphlets, radio broadcasts, newspaper and magazine articles, was discussed. To aid in the work a library at the national headquarters, 43 St. George Street, Toronto, is being established for books, pamphlets, addresses, statistics and other information. The aid of all national Service Clubs, Fraternal Societies, Church and Women's organizations is being sought through the national officials of these groups.

The Board of Directors.—The following were elected to the Board of Directors for the coming year:—Dr. J. S. McEachern, Mr. F. K. Morrow, Mr. E. S. Macfarlane, Mr. Napier Moore, Dr. George S. Young, Dr. W. E. Gallie, Dr. T. C. Routley.

Personnel of the Grand Council.—The following constitute the present Grand Council:—Dr. A. Y. McNair and Major Duncan Bell-Irving, of Vancouver, representing British Columbia; Dr. W. H. McGuffin, of Calgary, and Mr. John Blue, Edmonton, representing Alberta; Dr. E. B. Alport and Mr. Justice W. M. Martin, Regina, representing Saskatchewan; Dr. G. S. Fahrni and Mr. R. G. Persse, Winnipeg, representing Manitoba; Dr. G. S. Cameron, of Peterborough, and Mr. E. E. Reid, London, representing Ontario; Dr. A. T. Bazin and Mr. G. W. Bourke, Montreal, representing Quebec; Dr. A. E. Macaulay, of Saint John, and Mr. Justice J. H. A. L. Fairweather, Fredericton, representing New Brunswick; Dr. N. H. Gosse and Mr. R. V. Harris, K.C., Halifax, representing Nova Scotia; Dr. W. J. P. MacMillan and Mr. D. A. McKinnan, Charlottetown, representing Prince Edward Island.

Through close cooperation with the Department of Cancer Control of the Canadian Medical Association, the Provincial Divisions of the Canadian Medical Association, and all the medical societies throughout the various provinces the Canadian Society hopes by a concentrated well-organized campaign to aid in reducing the mortality in Canada due to cancer and to ameliorate in so far as possible the hardships and suffering caused by the ravages of this disease.

Provincial Association Notes

The Manitoba Medical Association

The Annual Meeting of the Manitoba Medical Association has come and gone and was a great success. We were honoured by the presence of Prof. K. A. MacKenzie, President, and Dr. T. C. Routley, Secretary, of the Canadian Medical Association; of Prof. A. T. Bazin, of McGill, and of Prof. L. H. Newburgh, University of Michigan. The two latter addressed a public meeting in the Winnipeg Auditorium on "Cancer—your problem", and "Normal nutrition". In addition they spoke at the scientific sections on September 22nd, 23rd and 24th.

There were many visitors from Saskatchewan and some from Alberta and western Ontario. The 1919 class had a delightful reunion at Lower Fort Garry on the night of September 21st. The Winnipeg General Hospital was host to the meeting at a luncheon on September 22nd, and St. Boniface Hospital had a luncheon on September 23rd. At the latter luncheon, the Hon. I. B. Griffiths, Minister of Health and Public Welfare, and F. W. Jackson, Department of Public Health, reviewed the work of the department. Dr. Couture, Director of Maternal and Child Welfare, Federal Department of Health, was introduced and asked for cooperation of the Manitoba doctors in making the pregnancy survey a success.

The business meeting was held on the night of September 22nd. The lengthy report of the Committee on Federation, presented by the Chairman, Dr. F. D. McKenty, ending with the following paragraph, "Your Committee is, therefore, reluctantly forced to recommend that the Manitoba Medical Association do not submit at present any application for admission as a Division of the Canadian Medical Association", provoked a full-dress debate in which Drs. F. D. McKenty, T. C. Routley, W. S. Peters, P. H. T. Thorlakson, C. M. Strong, Ross Mitchell and O. C. Trainor took part. Dr. McKenty contended that the Manitoba Medical Association had never been adverse to the principle of federation, but that the Constitution of the Canadian Medical Association is still defective in providing

the members with responsible government. On a standing vote the motion to adopt the report was carried, but the way is still open for negotiation. The strong support of federation argues that Manitoba will yet enter into federation.

The election of officers resulted as follows:—*President*, Dr. W. S. Peters, Brandon; *First Vice-president*, Dr. W. E. Campbell, Winnipeg; *Second Vice-president*, Dr. C. B. Stewart, Winnipeg; *Secretary*, Dr. C. W. MacCharles, Winnipeg; *Treasurer*, Dr. C. E. Corrigan, Winnipeg; *Rural Member of the Executive-at-Large*, Dr. J. Skafel, Minnedosa; *Winnipeg Member of the Executive-at-Large*, Dr. George Brock. Other members of the executive are appointed by the various affiliated societies.

Social events were not forgotten. Dr. C. W. Burns, retiring president, gave a dinner to the Executive Committee on September 21st. The Lieutenant-Governor, Hon. W. J. Tupper, and Mrs. Tupper were guests at the Annual Dinner and Dance on September 23rd. Mrs. C. W. Burns gave a tea for the ladies at her home, 129 Grenfell Boulevard, Tuxedo, and also a luncheon at the Manitoba Club for the wives of the retiring executive on the 23rd. Dr. J. D. McQueen was the winner of the golf tournament held on the afternoon of the 21st.

ROSS MITCHELL.

Medical Societies

The Montreal Medico-Chirurgical Society

The Sixth Annual Convention was held by the Montreal Medico-Chirurgical Society on October 19th to 22nd. This convention is developing into an event of considerable significance. Originally designed to extend over only a day and a half, it has now expanded to cover three and a half full days of clinics and addresses. The main teaching hospitals of McGill University are in entire cooperation with the scheme, and their rich clinical material is fully utilized. This year the convention opened with a morning at the Children's Memorial Hospital, a series of clinics and short addresses on subjects of general medical and surgical importance being given, followed in the afternoon by a program of papers at the Montreal Neurological Institute. The next two days were spent alternately at the Montreal General and Royal Victoria Hospitals, where a long series of clinics and short papers on subjects of general medical and surgical importance was given. The specialties also received adequate attention, and interesting exhibitions and demonstrations were carefully arranged. On Saturday morning the staff of the Maternity Hospital gave a series of demonstrations of operative technique.

Hospitality of an extremely pleasant nature was shown by the various hospital staffs in the provision each day of excellent buffet luncheons.

On Friday evening the regular dinner was held by the Society at the Windsor Hotel, when the guest of honour, Dr. C. F. Martin, spoke in reminiscent vein of the revolutionary changes that had occurred in medicine during his career.

The expectations of the officers of the Montreal Medico-Chirurgical Society in developing these conventions are being entirely fulfilled. Each successive year sees an increase in the attendance. This year the enrolment was nearly double that of the first occasion. The convention has become a valuable fixture in the calendar of annual clinical events.

H.E.M.

University Notes

Dalhousie University

The Dalhousie Medical School registration is complete with 216 students. Of the hundred odd applications for first year medicine, received from the Maritime Provinces and Newfoundland, 50 were accepted; from Dalhousie, 17; from St. Francis Xavier, N.S., 9; from Acadia, N.S., 7; from Mount Allison, N.B., 7; from Memorial University, Newfoundland, 4; from Prince of Wales College, Prince Edward Island, 3; from University of New Brunswick, 2; from Queen's University, Ontario, 1.

The death of the president-emeritus, Dr. A. Stanley MacKenzie, saddened the university, where he was a well known, well loved figure, to his last days taking a keen interest in the problems of the students and faculty.

Dalhousie was honoured recently with a visit from Sir Frederick G. Banting, representing the Associate Committee of Medical Research of the National Research Council of Canada. It was Dr. Banting's first visit to Nova Scotia, and he impressed all with his charm, and with the humility so often an accompaniment of true genius. His mission was twofold, to study the local field with a view to its potentialities for research; secondly (and of even great value from his hosts' point of view), to sow there the spirit of pure scientific investigation. Speaking at two meetings, to faculty, and again to the students, he presented his subject as something apart from scholastics and degrees, as something which may be wooed only with an open, unselfish ambition, which will bring its returns to the mind rather than to the body. The response from the student body, which, following his visit, called persistently on the faculty for further information on the new vistas he had opened, was high tribute to the impression made by Sir Frederick.

ARTHUR L. MURPHY

McGill University

Two newly established scholarships in the faculty of medicine at McGill University, founded in honour of Dr. Maude E. Seymour Abbott, were awarded by the university scholarships committee recently.

The winners of the scholarships are Miss Elizabeth N. Mackay, of Westmount, and William C. Gibson, Ph.D., of Concord, N.H. Miss MacKay is now in her fourth year medicine and Mr. Gibson in third year

The scholarships were established this year through an anonymous donation of $10,000 in honour of Dr. Abbott, B.A., M.D., F.R.C.P.(C.), LL.D., and in appreciation of her distinguished career, particularly in connection with her work in the history of Canadian medicine and the Sir William Osler pathological collection, and for her outstanding research in congenital cardiac disease. In this last ailment she is recognized as the most important of the pioneers in establishing this subject as a living part of clinical medicine.

The donor announced as his intention the desire to commemorate the career of Dr. Abbott by providing for a fund to encourage scholarship and to aid students of ability in their efforts to obtain a medical education. The revenues of the fund are to be used for this purpose and the awards may be made to any undergraduate in the faculty of medicine or any student of the faculty of arts and science who is preparing to enter medicine.

While both men and women are eligible for the awards, preference is to be given women students.

Special Correspondence

British Post-graduate Medicine

When the festivities following graduation had subsided I went with a classmate to the docks at Montreal. Here we signed on as cattlemen to work our passage to England. Soon we were sailing down the St. Lawrence, busily watering our share of the beasts. Our only medical consultation on this trip was in the case of a heifer with pneumonia. Percussion was managed with the gentle application of the toe of the boot. There was widespread consolidation and a fatal outcome.

On arrival in England we obtained a second-hand car and toured the continent. Medical examinations were thoroughly forgotten. This trip stimulated, rather than satisfied, my desire to travel, and so I now determined to finish my post-graduate training abroad.

After completing the next year at the Pathological Institute in Montreal I left for England again. Soon after arriving I found that resident hospital appointments (internships) were easy enough to obtain, but naturally the competition for the good appointments at teaching hospitals is very keen. The method of application is quite different from the custom in Canada. Your letter of application stating qualifications and experience, plus copies of testimonials, is prepared. Many candidates will have these printed and bound. The candidate now must "call" on each of the members of the Honorary Medical Staff and present his applications. One may have from 12 to 20 calls to make. The Honorarys are in most cases extremely polite, but very often quite frank in stating that they think your chances are poor. On the day of election each applicant must again present himself at the meeting. Selection usually goes to the best qualified man, although personality and the old school tie are of some importance. As the selections are made immediately prior to the commencement of the appointment there is not the same tendency to make applications for numerous jobs and to pick the most suitable, as often happens in Canada.

The Voluntary and County Hospitals

The large teaching institutions in London are all supported by public contributions, but the county hospital system is run directly from tax money and is growing rapidly. The appointments in these institutions are becoming more and more sought after. The material at such places is very good, but usually the investigations are not so complete as in the teaching hospitals. The full-time staffs of the county hospitals are well paid and these appointments are now going to men with the very best training and qualifications. A junior resident appointment in such a hospital gives much more responsibility, but less teaching, than a good internship in Canada. The salary for the junior appointment in the county hospital is usually $1,000.00 per year, with room and board.

Most of the teaching hospitals give an honorarium of $250.00 per year.

Locum Practice in England

There are various methods of making expenses in London while working for examinations. For some time I held a post as evening assistant to a general practitioner in north London. My duties were to see any patients who came to his office from 6 to 8 each evening. Practically all such patients were national health insurance cases and they had the "bottle of medicine habit" badly. They sometimes present a small chink between garments for examination and often mildly resent any further investigation. Usually if one suspects anything more than trivial illness they are given a letter to attend the nearest hospital. The pay is $50.00 per month, which helps make expenses while the day is spent attending courses or studying. Locums in general practice are plentiful. They pay $40.00 to $50.00 per week with board and lodging. Such jobs are a very pleasant change, as the work is interesting and varied. Most of the practitioners do

their own dispensing, and this forms a new experience for most recent Canadian graduates. It is possible in this way to save money enough to take "cram courses" in preparation for one of the higher examinations. Courses are given at the old teaching schools in London. They provide a good intensive revision; the fees vary between $100 and $200 for a three months' course. Some people are also able to add to their resources by coaching and correcting papers for postal courses.

THE HIGHER EXAMINATIONS

One of the best features of post-graduate training in England is the almost universal studying for one of the higher degrees or specialist diplomas. The younger staff men are continuously stimulated by the teaching for these courses. The hospital residents are always raising the standard by the great amount of reference reading done and continual practice of physical examination for test purposes. The Fellowship of the College of Surgeons requires a primary examination in anatomy, physiology and biochemistry which the Membership in the College of Physicians does not require. However, the membership candidate's proficiency in these subjects as well as in pathology is tested. The mortality rate in these examinations is between 60 and 75 per cent, and the standard seems to be continually improving. Still, one will notice that many of the candidates are grossly unprepared for such a test, and many of them are repeaters. Although I have only personal experience with the membership I believe that all the examinations are very efficiently run and they are fair tests of one's knowledge. Practical clinical proficiency is emphasized.

THE EXTRA ATTRACTIONS OF LONDON

While much excellent work is done in England outside of London, I believe it is best to spend most of one's time in London. Here there are innumerable clinical courses, demonstrations and lectures. The library facilities are unlimited. Also there is a wider opportunity to improve one's mind by contact with the other arts and with the great names in the various branches of medicine and science. The Royal Society of Medicine, Wimpole Street, is an institution with which every medical post-graduate student in London should associate himself. Here one is able to attend the monthly clinical meetings and demonstrations of interesting cases in each of the specialist sections. This gives a great opportunity for the young clinician to obtain the views of his colleagues about a rare case. Also the practice in case presentation and publication is useful. Both this and membership in the British Medical Association provide library facilities and journals. The post-graduate Fellowship of Medicine, also at Wimpole Street, arranges the numerous post-graduate courses and demonstrations in the hospitals, and its members are entitled to admission to these at reduced fees.

There are many opportunities for research in England. In most of the resident appointments use of the clinical material for such purposes is encouraged. Pure experimental work can be done through application for any of the numerous scholarships. A few men can obtain appointments to do work in surgical research at the Buxton Browne Research Farm at Downe.

The proximity to the Continent allows the post-graduate in England to combine his holidays with further medical experiences by visiting these centres. It is my impression however, that unless one plans to devote some time to learning the language, it is better to do most of your work in England. However, if one is anxious to get completely away from work I think that canoe trips in Germany in the summer, or ski-ing in Switzerland are ideal. The Scandinavian countries provide any branch of sport and many things of medical interest. All of these excursions can be done very *inexpensively*. The state medical schemes of the European countries are, for Canadians, very worthy of study.

THE ROUTE HOME

Having completed his training, the post-graduate in England has many opportunities of working his way home by interesting routes. I chose a ship's surgeoncy on a Norwegian vessel going around Africa to Australia. From Manila another of the same company's ships could be picked up—to go to San Francisco. However, a quicker route is via a Danish ship through the Panama Canal. Ship's surgeons' jobs direct to America are difficult to obtain, but occasionally can be landed. While this method of travel is necessarily slow, one is compensated by the opportunity presented for studying foreign methods.

SOUTH AFRICA

To have stopped for a few days at Capetown and Port Elizabeth is certainly not to have seen South Africa. Still there is much of interest in these places. The new modern Groett Schurr Hospital at Capetown is an ideal plant for medical education. The preliminary sciences are taught at the university, about ten minutes away. Pathology, anatomy, bio-chemistry, physiology are housed in new well-equipped buildings across the street from the hospital. This was one of the best equipped hospitals I saw in the Southern Hemisphere. The students were English- and Dutch-speaking, and the patients included half-castes and pure natives of many tribes. The racial problem, in Africa, is well exemplified here.

AUSTRALIA

At Melbourne a poliomyelitis epidemic was subsiding when I arrived. They had traced all contacts in a very thorough fashion, and there was definite evidence of contact spread. I was interested to note that there were also two well authenticated instances of cross infection, where

the cases were nursed in a general ward. The engineering and medical departments had co-operated very effectively in building respirators. There were 20 in operation at the Fever Hospital then. Experiments were also being conducted with a shaped chest-piece respirator for use in patients who were improving, so that they could be nursed and splinted more readily. The Sister Kenny Re-Education Technique has raised a great controversy and has served to intensify interest in this branch. Medical research is very active here. I was impressed by the large number of young men in Sydney and Melbourne who were holding part-time appointments at the university, teaching or doing research, and starting a consulting practice as well.

Locum tenencies in general practice are very easy to obtain as there is a shortage of doctors in the country districts. As a rule, there are district public hospitals where such practitioners have privileges. The work is typically varied. Save for hydatid disease in its various forms, the diseases seen are much similar to those of North America. A genuine bacillary dysentery epidemic was in progress, behaving much as I had seen it do in England. Locally, the impression was that these epidemics were related to drought years. This relationship does not seem tenable for England.

Club and Lodge practice is more common here than in Canada, and takes the place of National Insurance. However, these will probably be absorbed into the National Insurance scheme which is to be adopted soon.

FIJI ISLANDS

At Suva there is a medical school for training native medical practitioners. These men receive an intensive four years' training, and then return to their people to practise and do public health work. The students come from all the neighbouring Pacific Islands. The school, hospital, and laboratories are extremely well equipped. It is proposed in the near future to provide research facilities for Fellows holding research grants. The material is very extensive, and for anyone planning a career in tropical medicine Fiji should be an excellent place to work. The living conditions are very attractive on this beautiful island.

CONCLUDING REMARKS

London in recent years has been improving her facilities for post-graduate medicine. The organization of the British Post-graduate Medical School at Hammersmith was an important step in this regard. Here there is a full-time staff of good teachers. Courses are continuously being conducted to suit the needs of the *general practitioner or the consultant.* The fees for the courses are moderate, and living conditions in the vicinity of the school good. Resident appointments are made twice a year, usually from applicants who have been students there.

There is also a panel of teachers organized under the Fellowship of Medicine. These leading men will give individual or group instructions at fixed fees. The old specialist centres such as Queen's Square for Neurology; Brompton for Chest Disease; National Heart Westmoreland Street, for Cardiology; Great Ormond Street, for Children's St. Peter's for Stone, and Queen Charlotte's for Obstetrics are all continuously conducting post-graduate teaching schools where one can obtain specialist instruction or ward work.

With all these opportunities I think the Canadian profession will more and more be returning to England to complete their training.

REGINALD WILSON.
Vancouver, B.C.

Topics of Current Interest

Why Druggists Prescribe

The best pharmacists do not prescribe for their patients. Physicians have maintained that the best interests of the patient demand that prescribing be done by medically trained persons only; the ethical pharmacist should limit himself to compounding and purveying. If any one believes seriously that counter prescribing is not a standard trade practice in drug stores, attention should be called to an article in the November, 1937, issue of the *American Druggist* under the title "A Billion Dollar Sneeze".* This article presents many correct, pertinent and useful facts about colds, their infectiousness, the relation of metabolism and exposure to their occurrence, their cost, and what science knows about their prevention. Then tucked away at the end, next to advertisements of Adex Tablets and Smith Brothers' Cough Drops, are five steps to cold prevention by means of which the druggist is assured "your preventive products sales will increase". The first step is vitamins. "Science," it seems, has proved "that the vitamin A and D content of these [fish liver] oils helps in the treatment of colds, the laity terminology being that they help build up the resistance". The Council on Pharmacy and Chemistry does not allow such claims, but the council is not a sales organization. The second step is a laxative! "The laxative treatment you recommend can be a 10c item or a $1.25 sale . . ." The third step has to do with sales possibilities in nose drops, jellies, sprays and inhalants, and the fourth step cashes in on "any one of a number of mouth washes and gargles". In the fifth step the customer gets over on the alkaline side with milk of magnesia, antacid powders and tablets. And the climax:

* A Billion Dollar Sneeze, *Am. Druggist*, November, 1937, p. 24.

"Clerks should be taught the practical advantage of solicitous inquiries about the customer's symptoms. Muscular pains, sore throat, headache, clogged nasal passages, chills, chest pains, and coughs each may be the basis for the sale of a product over and above what the customer came in to buy . . . get your share of this billion dollar business . . . and you will make money out of sneezes and sniffles in 1937-38 . . . Ah-choo."

So pharmacy à la the *American Druggist* is a science and a profession. The science is salesmanship—but the profession is the practice of medicine. And for practising medicine the druggist needs a license in medicine.—*J. Am. M. Ass.*, 1938, **110:** 290.

The Therapeutics of Laughter

Mirth is to the human body as sunshine is to vegetation, Dr. S. A. Shoemaker claims in his article entitled "Laughter" in the April issue of *Hygeia.*

If we would have life abundant and flowing over, we need a copious supply of oxygen, the author declares, and this can be secured most easily through laughter. At the same time, this deeper oxygenization of the blood is secured without the irksomeness of conscious effort that accompanies exercise taken up for its own sake. Thus through laughter one can vitalize one's blood while reclining on an overstuffed couch when not able to engage in active sports in the gymnasium.

Laughter is a source of therapy for the neurotic, irregular heart. Patients with this affliction are afraid to laugh lest their heart will stop altogether; whereas experiments have proved that a hearty laugh repeated at proper intervals has relieved this trouble. The heart is deeply under the influence of the emotions, and the free outburst of laughter combined with its mechanical action produces a salutary effect on that organ.

Laughter is a good exercise for the digestive organs. They are definitely moved to increased activity by the shaking and massage they get from the abdominal muscles during laughter.

The ideas and situations that make us laugh are classified as wit and humour. Wit may be kindly, or neutral, or it may carry a sting of sarcasm. It is the shock of pleasant surprise from meeting unexpected difference between things that are alike; or it occurs as the result of utterly incongruous things combined in the expression of one idea. In contradistinction to wit, humour deals with incidents, characters, and situations. True humour is always kindly and gracious; while it points out and pictures the weaknesses of humanity, it feels no contempt and leaves no sting. It has its root in sympathy and blossoms out in toleration.

Laughter is a healer not only of the body but of the mind. It is the language of peace, sympathy, and good will. It is the fragrance of life that yields health and friends, and increases your bank account. Laughter was always an art. Recently it has become a science.—From *The Diplomate*, 1938, **10:** 126.

Abstracts from Current Literature

Medicine

The Evolution of the Parenchymal Lung Lesions in Rheumatic Fever and Their Relationship to Mitral Stenosis and Passive Congestion. Gouley, B. A.: *Am. J. M. Sc.*, 1938, **196**: 1.

In this report the author deals with the evolution of the pulmonary lesions of rheumatic fever, tracing the relationship of the acute pneumonia or pneumonitis to the chronic pathological changes seen in the lungs of patients who have mitral stenosis and other evidence of advanced rheumatic heart disease. The evidence which he has accumulated tends towards the view that the pulmonary changes in late rheumatic heart disease are not entirely due to congestive failure, but, rather, may be attributed in a major part to recurring inflammation such as may be seen in the heart in the prolonged course of rheumatic disease. The acute phase of rheumatic pneumonopathy is characterized by an interstitial hæmatogenous inflammation having the same pathogenesis as the arthritis and carditis. It varies greatly in severity and extent, appearing in some instances as small isolated hæmorrhagic foci of pneumonitis and in others as widespread pneumonic consolidation. The lower lobes are usually more extensively involved but the upper lobes may be equally affected. The process is commonly bilateral and may extend in a wandering, transient manner. The cellular infiltration is at first almost entirely of the monocytic type. During this phase fibrinoid necrosis may be widespread, involving the entire wall of the alveolus with destruction of its reticular framework and hyaline thrombosis of the capillary. Infiltration into the alveolus is not marked. The second or proliferative phase is ushered in by the replacement of the monocytic reaction by a perivascular infiltration with large basophilic cells of the Aschoff type. The final stage of the acute process is the replacement of the Aschoff cells by plasma cells, lymphocytes, and proliferative fibroblasts.

The subacute phase of rheumatic pneumonitis is a continuation of the reparative process already described. It is featured by marked changes in the consistency of the involved lung tissue due to the production of collagen by the fibroblasts and to basal atelectasis. At this stage microscopic examination reveals diffuse

interstitial fibrosis with œdema, some foci of acute pneumonitis, and in many instances numerous "*Herzfehler*" phagocytes.

In the chronic phase the involved lung becomes semirigid or rubberoid, due to the great thickening of the wall with collagenous fibrosis. During this phase arteritis and arteriosclerosis of the pulmonary vessels may be noted, but it is the author's belief that these changes are secondary to the chronic pneumonitis and the pulmonary hypertension. The author emphasizes again and again that all these changes may occur in young persons without mitral stenosis and without chronic passive congestion, and that they are a part of the clinical picture of rheumatic fever and not secondary to heart lesions which produce chronic congestion in the lungs. E. S. MILLS

The Relationship of Sydenham's Chorea to other Rheumatic Manifestations. Sutton, L. P. and Dodge, K. G.: *Am. J. M. Sc.*, 1938, **195**: 656.

This paper is based on the results of an intensive study of chorea over a period of 10 years at the Children's Cardiac Clinic and on the wards of the Children's Medical Service of Bellevue Hospital, New York City. It is part of an analysis of the records of 1,052 rheumatic children of whom 467 had chorea. As a result of this investigation the authors have come to regard chorea not only as a manifestation but as a major manifestation of rheumatic infection, because of the high incidence of rheumatic heart disease which ensues. They have been able to show from careful follow-up examinations that rheumatic heart disease develops in one out of five patients who have had chorea as the only clinical manifestation of rheumatic infection. Even more striking is the fact that a child who begins his rheumatic career with chorea runs a 50 per cent chance of developing rheumatic heart disease. This difference is due to the fact that other rheumatic manifestations invariably occur later.

Emotional factors were considered to be less important in irritating an attack of chorea than preceding acute infection, including rheumatic polyarthritis. E. S. MILLS

Surgery

Peritonitis. Harvey, H. D. and Meleney, F. L.: *Surg., Gyn. & Obst.*, 1938, **67**: 339.

This is a review of the literature on peritonitis for the past 6½ years. The literature is classified under several headings. Anatomically, stomata are present on the diaphragm only. Absorption is dependent upon heart action, tonus of the splanchnic vessels, peristalsis, and respiration; that of particulate matter and solutions on the lymphatics of the diaphragm and greater omentum and of bacteria in the blood stream in addition to the lymphatics. The chief phagocytic cells are the large reticulo-endothelial but in inflammatory conditions the peak of polymorphonuclear immigration appears within 3 to 6 hours, "withdrawal phenomena" from the peripheral circulation. Injection of any substance into the peritoneal cavity, electrical or mechanical stimulation of the parietal peritoneum produced a local slowing of the blood stream and of peristaltic movement which the author was able to correct by intravenous injection of saline or blood. In bile-peritonitis the bile salts are blamed for the profuse exudation which may approximate 1/3 of the blood volume and 60 per cent of the blood plasma. This is the cause of death as frequently as the bacterial infection which follows. The results from bacterial examinations of the peritoneal cavity are inconclusive inasmuch as most of the anaerobes are unreported. (The recent work on the association of *B. melanogenicum* and the anaerobic streptococcus is not given in this review). Reports of peritonitis caused by enterococcus, staphylococcus, pneumococcus, gas-bacillus, and lymphogranuloma inguinale are included. Flynn classifies peritonitis into the aseptic, due to mechanical injuries or chemical irritation, such as blood, bile, urine and digestive juices, and infective, primary and secondary, the prognosis in the secondary infective depending upon the promptness of the repair and in the other two upon the recognition of the causal factor. Orr states the rapid loss of 10 per cent of water is serious and 20 to 22 per cent water loss is fatal; but 40 per cent of loss of weight in protein, fat or carbohydrate is not necessarily fatal. In prophylaxis, (*a*) vaccines have some enthusiastic advocates, particularly in reference to colon-bacillus but, generally speaking, prophylaxis is not meeting with more than lukewarm-control measures. (*b*) Bovine amniotic fluid has had some mild success as a preventive of adhesions. (*c*) Filtrates and antivirus do not seem clinically justifiable, and the same seems to apply to bacteriophage, unless it can be made specifically for the infecting organism.

Under active treatment, operative measures, general treatment, serum (chiefly *B. coli*), bacteriophage, and ultraviolet rays are discussed. The physiological fundamentals are (1) the re-establishment of a normal fluid and electrolyte balance before or as soon after operation as possible; (2) the removal of the distributing foci of bacterial propagation; (3) the restoration of the peristaltic function of the gastro-intestinal tract. In the operative measures local and spinal anæsthesia, cœcostomy and less drainage of the peritoneal cavity have grown in favour.

In general treatment, Fowler's position, gastric suction through the nasal tube, the Oschner treatment and pitressin (as a prophylactic of ileus) are being used more often. The

reports from serum treatment are six times more favourable than adverse, although most of the reports have come from European centres. Bacteriophage, particularly that of typhoid fever, has still a place. Exposure of the operative field to the *Laparophoslampe*, giving a monochromatic light permitting line 366, has had some remarkable successes following its use. This has been confirmed by others, and probably further reports will be forthcoming: Havlicek had 108 cases of appendicitis followed by peritonitis without a single death. FRANK DORRANCE

Ambulatory Operative Treatment of Anorectal Pathological Conditions. Burt, C. V. and Rennie, J. G.: *Surg., Gyn. & Obst.*, 1938, **66**: 1054.

In selected cases the authors operate on chronic fissures and cryptitis, hypertrophied papillæ, simple uncomplicated anal fistulas and single internal hæmorrhoids, with the institution of ambulatory activities within 24 hours. In 194 operations they have used an oily solution (neothesol Yeomans) for the infiltration of the subcutaneous perianal tissues. Aqueous solutions of novocaine are used to produce the wheal. They have found anæsthesia to persist for periods of 10 to 14 days, thus relieving the post-operative pain and necroses, although they have several cases of necrosis of mild degree from the oily solution, in 6 per cent. The average dressings were 8.58 per patient. The fissures healed in an average of 44 days, the internal hæmorrhoids in an average of 38.6 days. They use short strips of gauze as packings, allowing it to come away with the stool after 48 hours. FRANK DORRANCE

Obstetrics and Gynæcology

Dystocia in Diabetes Insipidus: The Relation of Pituitary Oxytocin to Parturition. Fisher, C., Magoun, H. W. and Ranson, S. W.: *Am. J. Obst. & Gyn.*, 1938, **36**: 1.

Experimental diabetes insipidus was produced on seven cats during various stages of pregnancy by making appropriate lesions in the hypothalamus. These animals developed striking disturbances of the mechanism of parturition during which they were totally or partially unable to deliver their young or else succeeded in doing this only after a greatly prolonged labour which lasted in some instances over two days. Four of the cats died in the midst of labour; two survived for some days but finally succumbed; only one remained alive and in good condition. The theory is discussed that the disturbance noted was due to a deficiency in pituitary oxytocic hormone consequent upon interruption of the hypothalamico-hypophyseal tract. ROSS MITCHELL

The Potential Bisexual Character of the Ovary. Ramsay, A. J. and McCahey, J. F.: *Am. J. Obst. & Gyn.*, 1938, **36**: 104.

The ovary, particularly early in development, is interpreted as essentially bisexual, and in this is subject to wide individual variation. Both the cellular elements, interstitial cells and rudimentary testis tubules, found in the ovary are considered to represent undegenerated gonad materials which have become definitely testicular in direction of differentiation. In the light of the evidence obtained from this study the primary condition of the gonad is believed to be male. ROSS MITCHELL

Fetal Mortality in the Offspring of Apparently Healthy Women. Potter, M. F.: *J. Obst. & Gyn. of Brit. Emp.*, 1938, **45**: 233.

An attempt was made to discover if possible the cause of the fetal mortality of the offspring of apparently healthy mothers. Ascheim-Zondek reactions were performed at intervals on a group of healthy patients who habitually aborted and also on a similar group of normal healthy controls. It was found that the Ascheim-Zondek reactions on the series of healthy pregnant patients who habitually abort or whose children are still-born were definitely weaker than the reactions obtained from the urine of a similar series of normal pregnant women. The oral administration of large doses of corpus luteum to these women who habitually abort greatly increased their chance of a successful termination. P. J. KEARNS

Post-operative Exercises as a Preventive of Embolism. Shaw, W. F.: *J. Obst. & Gyn. of Brit. Emp.*, 1938, **45**: 451.

The author gives us the results of systematic exercises in post-operative cases, and compares the results in those receiving no post-operative exercises. The exercises consisted of raising the arms above the head and bending the knees about twenty times in succession, starting about the first day after operation. A pillow under the knees during the first few days retards the venous flow. In the wards of two different institutions under the care of the same gynæcologist, admitting the same type of patient, with the same pre-operative and post-operative treatment, except that in one ward systematic graduated post-operative exercises were given, there were 1,635 consecutive operations in the ward with graduated exercises, with an incidence of fatal pulmonary embolism of 0.06 per cent. In the other hospital, where no exercises were given, the same gynæcologist in the same years performed 3,618 operations, with an incidence of fatal pulmonary embolism of 0.304 per cent, a percentage incidence five times as great as that in the other group. P. J. KEARNS

Orthopædics

An Investigation of the Surgical Anatomy of the Ligaments of the Knee Joint. Horwitz, M. T.: *Surg., Gyn. & Obst.*, 1938, **67**: 287.

In recent literature there have been references by Conwell, Mauck and others upon the relatively lesser importance of the anterior and posterior cruciate ligaments in knee stability. In order to test the anatomical basis for these observations the author has performed experiments which he has listed in four groups, namely, (1) collateral ligaments intact with cruciate ligaments and other soft tissues severed; (2) cruciate ligaments intact with collateral ligaments and all other soft tissues severed; (3) femur split in the saggital plane; and (4) observations made in studies on unbared specimens, with division through small incisions of ligamentous structures singly and in combination. His observations will be of interest particularly to "industrial surgeons".

FRANK DORRANCE

The Mechanics of the Formation of the "Secondary Acetabulum" in Congenital Dislocation of the Hip. Farkas, A.: *J. Bone & Joint Surg.*, 1938, **20**: 885.

The author classifies dislocations of the hip as (1) the true congenital and (2) those occurring at or after birth. The former has an acetabulum more nearly approaching the physiological; it is deeper, more closely adapted to the femoral head and the upper margin is better defined. It is formed by direct pressure on the ilium while the post-natal acetabulum is formed by gliding and rubbing. The true congenital forms are much more difficult to reduce by traction, and retention is more unsatisfactory; their frequency is in the great minority and they are often associated with other maldevelopments.

FRANK DORRANCE

Pædiatrics

Complementary Feeding of the Suckling Infant. Russell, A. E. and McKeown, T.: *The Lancet*, 1938, **2**: 832.

At present an alarmingly large number of mothers resort to bottle-feeding because of difficulties which may be only temporary. Since a strong sucking stimulus is an important galactagogue the authors advocate the present new method of administering complementary feeding. The infant is weighed, put on the breast, and allowed to suck for as long as he will do so peacefully. As soon as he begins to refuse, the complementary feed, which is contained in a boat-shaped bottle attached to the mother's shoulder, is administered through a number two soft rubber catheter. This is inserted gently into the baby's mouth beside the nipple and the baby, apparently unaware of the catheter, sucks vigorously as soon as the milk flows into his mouth. The rate of flow can be controlled by pressure on the catheter. If the child is weighed again after the complementary feed the amount of breast milk obtained can be calculated.

Cases are cited, and it is claimed that in each case it was only necessary to maintain the suckling stimulus while giving the complementary feeding and eventually milk secretion returned to a normal level.

REGINALD WILSON

Sulphanilamide in the Treatment of Ophthalmia in Children. Michels, M. W.: *J. Pediat.*, 1938, **13**: 527.

In this article a control group of 32 cases of gonorrhœal ophthalmia, treated with boric irrigations and argyrol or silver nitrate instillations is compared with 15 cases which had similar local treatment plus sulphanilamide by mouth. The children were given 1 grain of sulphanilamide per pound of body weight per day, with an equivalent amount of sodium bicarbonate in Karo water feedings. Blood sulphanilamide estimations were made, and ranged between 3 to 5 mg. Three negative smears were obtained in all cases before discharge. The average period of hospitalization required for the sulphanilamide-treated cases was 5.8 days as compared with 28.5 days for the control group. Corneal involvement occurred in 4 control cases, two going on to perforation. Of the sulphanilamide cases 2 showed corneal involvement; perforation did not occur in any case. None of the complications attributed to sulphanilamide occurred with the dosage given.

REGINALD WILSON

Ophthalmology

Eserine: its Use in the Treatment of Keratitis. Kalaschnikov, W.: *Ann. d'Ocul.*, 1938, **175**: 396.

It is now fifty years since Professor Donberg published an article in which he recommended the use of eserine against diseases of the cornea. Twenty years later articles appeared by Katz and Kasas showing the excellent results obtained from its use in these affections. During the last twenty-five years the author has had an opportunity of confirming the great benefit of eserine in many serious cases. In ophthalmological literature atropine is given the first place among therapeutic agents in corneal diseases, while eserine is called a secondary remedy. In fact, in the last edition of Professor Fuchs' manual (1932) in the long chapter on disease of the cornea, eserine is not mentioned. Atropine, used in keratitis in the fear of an eventual iritis, blocks the iris against the ciliary body and prevents the circulation of endo-ocular fluids, and thus risks an elevation of the ocular tension. The author concludes that eserine is the best agent against corneal

affections, confirming the opinion of Donberg. It is perhaps well to add some reservations, such as that in the course of an iritis it might be wise to replace atropine by myotics when atropine is badly tolerated, or employ alternately atropine against iritis and eserine against the secondary effects of atropine on the cornea. S. HANFORD MCKEE

Obliteration of the Retinal Arteries and Retinal Arterial Hypertension. Bistis, J.: *Ann. d'Ocul.*, 1938, **175**: 447.

The causes of retinal arterial hypertension are known and have been described. In general hypertension the retinal arterial pressure is elevated, the two tensions as a rule being generally related. In albuminuric retinitis the retinal arterial tension is also much elevated. We meet a similar hypertension of less degree in diabetic retinitis as well as in the hæmorrhagic retinitis of the aged. Syphilis is a frequent cause of retinal arterial hypertension. A case report is given showing retinal arterial hypertension in a case with obliteration of the vessels of the retina.

Mme. S., aged 47; urine normal, and the Wassermann test negative; general arterial tension 21/13. The vision of the right eye was 7/10, the field contracted, with a paracentral scotoma. The superior temporal arteries were transformed into whitish threads. In the left eye vision was 1/10, the visual field retracted similarly to the right, and here too there was a paracentral scotoma. The superior temporal arteries appeared as white bands. The disc was atrophic, and there were numerous retinal hæmorrhages.

The author concludes that with the obliteration of the branches of the central artery of the retina there was an increase in retinal tension, probably influenced somewhat by the general hypertension. S. HANFORD MCKEE

Neurology and Psychiatry

The Relation of the Cerebral Cortex to the Grasp Reflex and to Postural and Righting Reflexes. Bieber, I. and Fulton, J. F.: *Arch. Neurol. & Psychiat.*, 1938, **39**: 433.

The postural reflexes, so ably described by Magnus and De Klein, have long been a topic of great interest, but also a source of much bewilderment to the medical profession. Normally suppressed by cortical influences, the exact localization of their controlling mechanism has remained in doubt. The present study should bring some light to bear on a vexed problem.

The authors find that in monkeys complete bilateral ablation of both motor and premotor areas is necessary to set free the reflex mechanisms. So long as any part of either motor or premotor area remains the reflexes cannot be elicited. Coincident with the postural reflexes appears the grasp reflex, also present only in the thalamic preparation (*i.e.*, in animals with both motor and premotor areas extirpated). This grasp reflex is independent of the condition of the skin receptors, is most easily elicited by stretch of the digital tendons, and is regarded by the writers as an integral part of the body-righting reflex mechanism. G. PATERSON-SMYTH

Reference to Sex Organs and Functions in Speech Productions of Two Pre-school Children. Low, A. A.: *Arch. Neurol. & Psychiat.*, 1938, **39**: 519.

The author has made a praiseworthy effort to subject certain psychiatric concepts to objective study. No topic has raised a greater storm of controversy than Freud's views on infantile sexual interests. As the author points out any conclusions drawn apply only to the two children studied, and no generalizations are justifiable. Careful verbatim recordings showed that while the children asked many questions about non-genital spheres one child asked very few, and the other no questions, referable to sex organs or functions. This suggests that in these cases at least any excessive curiosity is lacking. The paper is presented as a strong plea for the value of further objective studies ere dicta be uncritically and possibly emotionally accepted or rejected. G. PATERSON-SMYTH

Therapeutics

A Further Evaluation of Artificial Pneumothorax in Lobar Pneumonia. Blake, F. G.: *J. Am. M. Ass.*, 1937, **111**: 580.

There has never been very keen enthusiasm over the value of pneumothorax in lobar pneumonia. In this paper Dr. Blake refers to previous reports in which it was shown that no benefit was obtained in late cases of more than 72 hours' duration or in earlier cases with adhesions. There were a few cases however in which the response to this method of treatment was so encouraging that it seemed justifiable to study the question further and try to reach a definite conclusion as to the value and limitations of this treatment. A series of 30 additional cases of pneumonia was therefore treated with collapse of the affected lung and the results are here described.

The conclusions based on the combined series (72 in all) are that pneumothorax is of no value in late cases of more than 72 hours' duration, nor in earlier cases with pleural adhesions. These very seriously limit its possible usefulness, since many cases are only seen late, and adhesions occur in from 30 to 40 per cent of early cases. A further important limitation is that it has no influence on an established bacteriæmia, nor does it prevent subsequent invasion of the blood by pneumococci. In the majority of 33 early cases without adhesions the results were good enough to suggest bene-

ficial effects from the collapse, but other factors had to be considered, such as age, absence of bacteriæmia, type of infection, extent of lung involvement and time of treatment. All of these, as it happened, favoured the cases receiving pneumothorax. That it relieves pleural pain in selected early cases may be allowed, but its curative value in pneumonia has not been demonstrated. H. E. MACDERMOT

Prothrombin Deficiency and the Bleeding Tendency in Obstructive Jaundice and in Biliary Fistula. Effect of Feeding Bile and Alfalfa (Vitamin K). Brinkhous, K. M., Smith, H. P. and Warner, E. D.: *Am. J. M. Sc.*, 1938, **196**: 50.

The authors present evidence to show that the bleeding tendency which develops in many cases of chronic biliary obstruction and in biliary fistula has little to do with bile *per se* but is dependent on a reduction in the plasma prothrombin and a deficiency in vitamin K. To correct this hæmorrhagic tendency they recommend a diet of hay and bile. The hay (or alfalfa) is administered as a thick greenish greasy residue obtained from alfalfa meal by distillation, filtration, and concentration from a petrolatum solvent. This residue is emulsified in human bile or in 2 per cent sodium taurochlorate and presented to the patient for oral consumption "in the early evening hours". The dose per diem is that derived from 200 to 400 grams of alfalfa meal. The method has been tried on 27 patients with singular success, except in cases where there has been marked liver damage. E. S. MILLS

Pathology and Experimental Medicine

Human Encephalitis Caused by the Virus of the Eastern Variety of Equine Encephalomyelitis. Fothergill, L. D., Dingle, J. H., Farber, S. and Connerley, M. L.: *New Eng. J. Med.*, 1938, **217**: 12.

During the past summer there has been an epidemic of encephalitis among horses in Massachusetts. In this same period a number of cases of encephalitis have occurred in infants and children. The authors have isolated from a fatal human case of encephalitis a virus agent which appears to be identical with the eastern variety of encephalomyelitis.

Following necropsy, brain tissue was emulsified in saline and injected intracerebrally into albino Swiss mice; these mice died of encephalitis. All bacteriological cultures taken from the human tissue as well as those of mice were negative. The virus passed through "N" and "V" Berkefeld filters.

Two guinea pigs, actively immunized against the eastern variety of equine encephalitis virus, one immunized against the western type, and three normal controls were injected intracerebrally with mouse brain virus which had originally been obtained from the brain of the patient. The control animals and the animal immunized against the western type died of encephalitis in two to five days. The animals immunized against the eastern type have remained perfectly well. Histological examination of the brains of mice and guinea pigs which died following inoculation with the virus verified the diagnosis of encephalitis.

Abstractor's Note. In the same Journal is a letter from Dr. Alton S. Pope, Deputy Commissioner of the Massachusetts Department of Public Health, stating that this work has been confirmed in three additional cases by Dr. Leslie T. Webster, of the Rockefeller Institute of New York. He also says that in view of our knowledge that the disease in horses is transmitted by mosquitoes, it is reasonable to assume that it is conveyed to man in the same way. He suggests that children in the area affected be protected from mosquitoes by screening, by sprays, and by keeping them indoors after dusk. The Massachusetts Division of Livestock Disease Control is planning to push the immunization of horses, with the hope of having every horse in the state immunized by June 1, 1939. LILLIAN A. CHASE

Requirements for Vitamin C in Man. Heinemann, M.: *J. Clin. Investgation*, 1938, **17**: 671.

At least 0.8 mg. of ascorbic acid per kg. of body weight is used daily by healthy persons saturated with this substance. Smaller amounts maintain a lower concentration in the body stores. To protect against scurvy 0.4 mg. per kg., or even less per day, appears to be sufficient. Abnormally high requirements are observed in patients with active tuberculosis, but are not specific for this disease. The requirements have been found to be increased to some extent in patients with peptic ulcer. The author suggests a comparatively simple method for the rough estimation of the daily requirements. JOHN NICHOLLS

Basal Gastric Secretion in Cases of Peptic Ulcer: Relation of Acidity to Healing of the Ulcer. Bloomfield, A. L. and French, L. R.: *J. Clin. Investigation*, 1938, **17**: 667.

Studies of the basal gastric secretion in cases of peptic ulcer showed that the average basal acidity in duodenal ulcer was approximately twice as high as that in gastric ulcer. The basal acidity in individual cases of gastric ulcer varied from 0 to 77; in duodenal ulcer from 24 to 140. There was no correlation between the degree of acidity and the speed of healing in the case of either duodenal or gastric ulcer. JOHN NICHOLLS

Anæsthesia

Our Experiences in the Employment of Spinal Anæsthesia for Thoracoplasty. Gurd, F. B., Vineberg, A. M. and Bourne, W.: *J. of Thoracic Surg.*, 1938, 7: 506.

The authors report 9 patients operated upon using high nupercaine spinal anæsthesia representing a total of 17 operations. Of these 5 were first stage thoracoplasty (1st, 2nd and 3rd ribs), 7 were second stage (4th, 5th and 6th ribs), and 5 were third stage (7th, 8th and 9th ribs). There was no mortality in the series reported, and no anxiety for the patient's welfare during the recovery period. The patients were uniformly cooperative and not unduly apprehensive as a result of liberal premedication with morphine and scopolamine.

The technique first described by Etherington-Wilson was used in all cases. The premedication consisted of morphine, gr. ½, scopolamine gr. 1/50, and atropine gr. 1/150 given hypodermically one-half an hour before operation. Employing the Etherington-Wilson technique with nupercaine 1:1500, the patients were seated upright and lumbar puncture was performed in the 2nd or 3rd lumbar interspace. The injection consisted of 15 to 17 c.c. of nupercaine which was allowed to rise in the spinal canal for a period of 55 to 60 seconds. This resulted in anæsthesia up to and including the lower cervical segments, and is suitable for operations up to the first rib. At the end of the pre-determined number of seconds, the patient's position is quickly changed to that of recumbency and the head of the table is tilted slightly downward. This effectually prevents the anæsthetic solution rising higher in the canal. It would appear that the maximum time that it is safe for the patient to be allowed to sit upright is 65 seconds and the maximum quantity of the solution should be 17 c.c.

Analeptics such as ephedrine were not used routinely as it was felt that they increased the blood pressure to the point of causing considerable oozing, and also tended to undo the desired depressant effects of the hypnotic drugs employed. However, in accordance with the teachings of Yandell Henderson, at the end of the operation 1/30 gr. of strychnine was given hypodermically with the object of alleviating the depression of muscle tonus which spinal anæsthesia causes. This was repeated every four hours, for three doses. Oxygen and carbon dioxide were also administered off and on for several hours after the return of the patient to bed.

The results obtained have tended to justify the method as a routine anæsthetic procedure for the operation of thoracoplasty.

F. ARTHUR H. WILKINSON

Obituaries

Sir Henry McIlree Williamson Gray, of Montreal, a well known surgeon, died on October 6, 1938, in his 69th year.

Sir Henry Gray was born on March 14, 1870, the son of A. R. Gray, a merchant of Aberdeen, Scotland. He was educated at Merchiston Castle School, Edinburgh, and at Aberdeen University and subsequently studied in Bonn, Leipzig, Berlin and London. From 1876 to 1913 he had his headquarters in Aberdeen, where he practised as a surgeon. He served as surgeon in the South African War, being attached to Sir James Sivewright's Ambulance, caught enteric fever in Kimberley and was invalided home in 1900, with the South African medal, one clasp, and the rank of major. In the Great War he was consulting surgeon to the British Expeditionary Force in France with the rank of colonel, stationed at Rouen. Subsequently he was attached to the Third Army as consulting surgeon, under General Byng. He was later recalled to England to cooperate with Sir Robert Jones in orthopædic work, with the title of Consultant in Special Military Surgery, and retained that office and title until his demobilization in 1919. He acted as consultant surgeon to the Royal Hospital for Sick Children in Aberdeen and in May, 1923, was appointed surgeon-in-chief of the Royal Victoria Hospital, Montreal. He remained in that office until September 29, 1925, when he tendered his resignation and also terminated his connection with McGill University, where he had been on the faculty of medicine since his arrival in Montreal. He withdrew from both institutions and carried on private practice from then until his death. In addition to his private practice he was head of a private hospital.

He was created a C.B. in 1916; a C.M.G. in 1918; and a K.B.E. in 1919. In addition to his medical degrees he held an honorary LL.D. of Aberdeen University.

Sir Henry is survived by his widow, the former Katharine Anne Rattray; one son, Henry, in England; and two daughters, Katharine, in England, and Esther, of Montreal.

Dr. John Edward Wesley Anderson, of Scotland, Ont., died on October 25, 1938. Dr. Anderson was 76 years of age. He graduated in 1884 from Trinity University, Toronto, took post-graduate work at Edinburgh University, and in that city began his practice. Returning to Canada he was for some eight years practising in Millgrove, Ont., and for the last forty-three years he had been at Scotland. At the time of his death he was Medical Officer of Health for Oakland Township.

Dr. James Clark Bell, of Bowmanville, Ont., died on October 22, 1938. He was born in 1868 in Scotland, and was a graduate of the University of Aberdeen (1909). He obtained the D.P.H. in 1910, and the F.R.C.S.(Edin.), in 1920. For two years he assisted a doctor in Edinburgh, doing past-graduate work at the same time, and for four years, while Senior Assistant Medical Officer of the Carnegie Trust in Scotland, he lectured on anatomy and was ophthalmologist to clinics at Dunfermline College. Later he practised medicine in Aberdeen for five years, with the exception of time spent in France during the war, stationed at No. 2 Hospital. After fighting ceased, Dr. Bell was acting Specialist Sanitary Officer, No. 1 Base Headquarters, Havre, France. Returning to Aberdeen for a short time, he later went to India as one of the surgeons at Kolar Hospital, Bangalore. From there he went to Gold Coast, West Africa, where he was surgeon at Sekondi Hospital. He returned to Aberdeen, but after four years his health became impaired and he was advised to seek a change of climate and came to Canada.

Dr. William Henry Chase, of Montreal, died on October 20, 1938, in his forty-fourth year. He was a

native of Wolfeville, N.S., and educated at Acadia and Dalhousie Universities. He served overseas with a medical corps organized among Dalhousie students. He had been on the staff at McGill University since 1925, where he was Lecturer and Douglas Fellow in Pathology and Curator of the Medical Museum. Dr. Chase was connected with the Pathological Departments of the Royal Victoria and Women's General Hospital, Montreal, and was well known as an investigator and writer on medical subjects. He is survived by his widow, formerly Miss Helen Geddes Webster, two children, William and Frances, and a sister, Dr. Lalia Chase, of Port Williams, N.S.

Dr. George Edward Clerk, of Montreal, died on November 15, 1938. Dr. Clerk was born in Beloeil, Que., on July 4, 1877, the eldest child of the late George Edward Clerk and Henriette Davignon, and grandson of George Edward Clerk, founder of the *Montreal True Witness*. He received his preliminary education at the Jesuit College there, later studying medicine at Laval University, receiving his degree from Laval in 1911. He began his medical practice in Montreal, and later practised in Vancouver, Melville and Ponteix, Sask., before returning there 15 years ago. During the Great War he served with the Canadian Medical Corps from 1914 to 1917, and was decorated with the Military Cross and France's Academic Palms.

Lieut.-Col. Robert John Gardiner, M.D., of Biggar, Sask., died on August 8, 1938. He was a graduate of McGill University (1902).

Dr. Peter John Fisher Houston, of Toronto, chief of the eye, ear, nose and throat section of the East General Hospital, died on November 7, 1938. Born at Greenock, Bruce County, Dr. Houston received his education at Walkerton High School and graduated from the University of Toronto in 1904, when he received his degree of M.D. Following post-graduate study in Edinburgh, he received the degree of L.R.C.P. in 1905.

Dr. William Archibald Kerr, a medical practitioner in Elora, Ont. for more than 35 years, died on October 16, 1938. Born in Huron county in 1872, the son of the late Mr. and Mrs. James Kerr, Dr. Kerr was educated at Seaforth High School and later attended Stratford Normal School. He taught school before entering Trinity University, Toronto, where he graduated in medicine in 1899. He later was on the staff of the Toronto General Hospital and St. Michael's Hospital. He practised in Colorado before coming to Elora in 1902. He had been for more than twenty-five years M.O.H. of Elora and Nichol Township.

Dr. J. H. Knight, of Moose Jaw, Sask., died on August 7, 1938. He was born in 1857 and a graduate of Queen's University (1880).

Dr. J. Aubrey Lippincott, aged 91 years, died at his home in Nice, France, where he has been living in retirement since 1925. Dr. Lippincott's career was long and colourful. Born in New Glasgow, Nova Scotia, May 31, 1847, he was principal of Pictou Academy at the age of nineteen, following his graduation in arts from Dalhousie. In 1869 he entered Jefferson Medical College, but left there to serve in the American west, in the United States army under General Sherman. Returning to medicine, he graduated in 1873 and practised for many years in Pittsburg where he was chief surgeon of the Pittsburg Eye and Ear Hospital. For a period of years he served as chairman of the Eye Section of the American Medical Association. Leaving Pittsburg because of his health in 1909, he practised for several years in Rome, Italy, before finally moving to Nice. Here and at Monte Carlo he continued in his work until his retirement.

The second oldest living graduate of Dalhousie, Dr. Lippincott was the recipient of an honorary degree from his Alma Mater and was making plans for returning to his native province when death overtook him.

Dr. Rosaire Georges Matte, of Quebec, died on October 30, 1938, aged seventy-seven. He was a graduate of Laval University, Quebec (1884).

Dr. William Mott, who practised medicine at Rathwell for 35 years, died on October 20th at his home in Winnipeg, after a short illness. Born in England, Dr. Mott came to Canada in 1888. For a time he farmed at Russell, then studied medicine, graduating from Manitoba Medical College in 1906. At Rathwell he rendered valuable service to the community and enjoyed the respect and affection of a wide circle.

Dr. Hector Howard MacKay, of New Glasgow, N.S., died on September 25, 1938, in his eightieth year. He was born at Plainfield in 1858, attended Pictou Academy, and after teaching school he entered the study of medicine at McGill University, where he graduated in 1890. He had practised medicine at New Glasgow for forty-eight years.

Dr. John MacKay died at his home in New Glasgow, N.S., on October 9, 1938. He was 79 years of age. Dr. MacKay was senior doctor on the staff of the Aberdeen Hospital with which he had been associated since its founding forty years ago. Born at Balmoral Mills, Colchester County, in 1859, Dr. MacKay spent several years teaching school before taking up the study of medicine. In 1886 he graduated from Bellevue Medical School, and after three years of practice in Thorburn did post-graduate study in Edinburgh. Returning from there he soon took up his work in New Glasgow where he served until his death, a well respected and loved member of the community.

Dr. Hugh Howard Mitchell, superintendent of Regina General Hospital since 1932, died on October 14, 1938. He was born at Niagara Falls, Ont., in 1883, and attended high school at Niagara Falls. He graduated in 1910 from the University of Toronto. After taking three years' post-graduate work in New York at St. Vincent's, Bellevue, Manhattan Maternity, and Willard Parker Hospitals he came to Regina in 1913. During the war he was M.O. for M.D. 12. For many years he was a coroner in Regina.

Dr. Stephen Henry Murphy, of Renfrew, Ont., died on October 28, 1938, aged seventy-four. He was a graduate of Trinity University, Toronto, in 1894 and had practised in Renfrew for forty-four years.

Dr. George William Racey, of Parkhill, Ont., was instantly killed in an automobile accident on October 13, 1938. He was born at Florence, Ont., 56 years ago, the son of the late Rev. George W. Racey and Mrs. Racey. He received his early education at schools in Lambton, Essex and Elgin counties, where his father was stationed, and graduated from the University of Toronto Medical School (1907). Following his graduation he spent considerable time at the Mount Sinai Hospital in New York, and late in 1908 came to Parkhill, where he bought out the practice of the late Dr. Cawthorpe. In 1925 he was a member of the Parkhill town council and in 1926 served as mayor. He was medical health officer for West Williams.

Dr. Reginald Francis Scott, of Toronto, died on October 14, 1938, in his forty-first year. Dr. Scott was a graduate of the University of Toronto (1926). He attended Jarvis Collegiate and Upper Canada College. He served in the tank corps during the war and was medical officer of the Royal Canadian Engineers at the time of his death.

Dr. Dennis Maxwell Smith, of Madsen, Ont., died on October 30, 1938, from burns received when his costume caught fire at a masquerade party on Saturday, October 29th. He was thirty years old and a graduate of Queen's University (1933).

Dr. Lorne Joseph Violette died at his home in St. Leonard's, N.B., on October 6th following a heart attack. He had been in ill health for about a year. Dr. Violette had been Mayor of St. Leonard's for several years and was keenly interested in provincial politics, being first elected to the Legislative Assembly for Madawaska in 1922. He retired from public life in 1935. He was born in St. Leonard's on September 7, 1884, and was educated at St. Joseph's University, Memramcook, and at Laval University, Montreal.

Dr. Wilson Yates Young, of Toronto, died on October 7, 1938. He was the second son of the late Archibald Young, of Toronto and Sarnia, and a graduate of Trinity University, Toronto (1895).

News Items

Alberta

Dr. Alexander Munroe, of Edmonton, has resigned his position as Professor of Surgery, in the University of Alberta. He has been succeeded by Dr. W. Fulton Gillespie.

Medical students to the number of 218 have been enrolled at the University of Alberta this fall. Among them are many sons of Alberta practising physicians.

The registration of foreign physicians is agitating the Council of the College of Physicians and Surgeons, especially as there are so many men who find difficulty in meeting expenses where they are located. There are many vacancies which could be filled were the local authorities to assume the responsibility of their indigent residents, but putting the burden on the physician makes the situation impossible.

Our provincial authorities express the willingness to help the situation, but claim they are powerless on account of lack of funds. Some foreign physicians offer to treat the indigents free if localities will help them get qualified, but that offer is no inducement; the indigents are treated free now for the most part, as there is no accepted systematic way of financing these cases and the local physicians do the work.

The new Highway Commission has decided there is too great a hazard to the public from truck and bus drivers unless the said drivers are physically fit. The Commission has prepared a form which must be signed by the examining physician, and presented by the applicant seeking a driver's license. The examination must be thorough, equal to insurance examinations in all things, and greater as to sight and hearing. It is realized that these drivers have greater responsibility than locomotive engineers, as they have no despatcher to keep the road clear, and bus drivers are conductors and express messengers as well.

The Cancer Control Society is well on its way for a thorough organization of the province. Important centres have been chosen for local organizations, and to these centres are added adjacent rural territory which is tributory to and does business in these towns. It is felt that later on it may be possible to divide the districts into smaller units, when the spirit of the cause has gripped the people.

A special session of the Provincial Legislature has been called for November 15, 1938, but, as it is to deal with the oil situation, it is not anticipated that any other serious legislation will be passed.

At the first monthly meeting of the Calgary Medical Society for the 1938-39 session, held on October 6, 1938, the members were addressed by Dr. Willis Merritt on "A general survey of myocardial diseases" and by Dr. H. N. Jennings on "Irregularities of the heart".

G. E. LEARMONTH

British Columbia

The recent post-graduate tour which was conducted by the British Columbia Medical Association was a very successful one. The speakers on the tour were Drs. Murray McC. Baird and Roy Huggard. They were accompanied on their trip by Dr. M. Thomas, Executive Secretary of the Association. Full attendances were reported all along the route and the addresses were well received. The titles of their papers were as follows: Dr. Murray Baird, "Treatment of medical emergencies" and "Some remarks on rheumatic diseases"; Dr. Roy Huggard, "Carcinoma of Breast" and "Radical versus conservative treatment in acute cholecystitis". In addition to this, public addresses on the work being done on cancer in British Columbia were also given.

A new departure in journalism was made during the last month, when the Vancouver *News-Herald,* the morning paper of the city, published a special number in honour of the fortieth anniversary of the Vancouver Medical Association, which celebrated this milestone in its history this fall. The publishers of the paper approached the Executive of the Association with the request to be allowed to do this, and the latter agreed, on the understanding that all matter that was to appear in the issue should be submitted to the Editor of the *Bulletin of the Vancouver Medical Association,* for his approval. The producer of the issue most loyally adhered to this arrangement, with the result that there was a total absence of anything that might be foreign to our ideas of what would be proper. A copy of this issue has been sent to the Editors of the *Journal,* and we feel that it was a very praiseworthy effort.

The recent epidemic of typhoid fever which occurred at Merritt, B.C., presented a very puzzling problem for a while to the provincial health authorities, who made a most thorough and energetic search for all possible causes. The origin of the infection was finally found to be a helper in the delivery of milk from a dairy which supplied a large number of people. This man was a carrier of the disease, and has been isolated and put under proper treatment. The epidemic caused two deaths, and a great many of those attacked were seriously ill. The Provincial Health Department is to be congratulated on the speed and thoroughness with which they attacked the problem.

The first clinic in Western Canada devoted solely to the diagnosis and treatment of cancer will be opened by Lieutenant-Governor E. W. Hamber at an early date in the building now being prepared for the work of the first unit of the British Columbia Cancer Foundation. This is situated in Vancouver.

Dr. G. M. Shrum, Honorary Secretary of the Foundation, also announces the appointment of Dr. A. Maxwell Evans as permanent radium therapist.

Dr. Evans was born in Vancouver and took his pre-medical course at the University of British Columbia with a brilliant record. He graduated in medicine from McGill University (1932), and later obtained a diploma in medical radiology and electrology from Cambridge. He was surgical registrar at Mt. Vernon Hospital for Cancer at Northfield in Middlesex, England; resident medical officer at the Radium Institute, London; and assistant radiologist at Addenbrooke's Hospital, Cambridge. He returned to Vancouver last June.

Dr. J. A. MacMillan and Dr. Frank Hebb, Vancouver physicians, will be part-time medical officers of the clinic. Miss Dorothy Findley, of the General Hospital radiological department, was appointed radium nurse. Other medical nurses will be chosen. Dr. MacMillan graduated from the University of British Columbia and has been practising medicine in Vancouver for some years.

Initial supply of 260 radium needles, processed from one gram of the element, will be in the city in a few days. The needles are being tested and weighed in Ottawa by the National Research Council. The remaining two grams of radium will be fitted into a "bomb" for deep-therapy treatment as soon as finances permit.

J. H. MACDERMOT

Manitoba

The regular monthly meeting of the Winnipeg Medical Society was held on October 21st. Dr. K. C. McGibbon read a paper on "The treatment of acute bursitis", and Dr. E. A. Deacon read a paper on "Treatment of infantile paralysis during the stage of recovery". A paper prepared by Dr. Ross Mitchell on "Dr. John Bunn, pioneer physician of the Red River Settlement" was read before the meeting of the Medical History Club of Winnipeg on October 27th.

The Sanatorium Board of Manitoba has purchased a new portable x-ray equipment at a cost of $1,333.00 and a new Ford 1½ ton truck to be used for the Travelling Clinics. An anonymous gift of $1,000 to the Manitoba Sanatorium at Ninette made possible the purchase of new mattresses and equipment. The Sanatorium now receives its electrical energy from the Manitoba Hydro Commission, and the motors have been changed from direct to alternating current.

ROSS MITCHELL

New Brunswick

To the Medical Profession of New Brunswick.—This month a special number of the *Canadian Medical Association Journal* is being sent you with the expectation and hope that it will stimulate your interest in the work of the Canadian Medical Association. We need your interest and support and your advice in regard to present day medical problems.

Do you wish the Canadian Medical Association to grapple with such problems as state medicine, health insurance, group hospitalization, etc., or do you wish such problems left to each division or branch to handle in its own way? Should the Canadian Medical Association lead the way in these matters? You can help the Canadian Medical Association in charting its course in contentious matters by your criticism and advice. The employment of municipal doctors, the problem of medical care for those on relief—how shall the profession be compensated, and a great many problems similarly affecting you and your livelihood must be solved in the next few years, with what satisfaction to you will depend on the united efforts of the profession and the study and influence exerted by every member of it.

So why not join the Canadian Medical Association? By this time you should have received a complimentary copy of the "Handbook on Cancer". This book has been distributed gratis to every member of the profession in the Dominion and to the seniors in medicine at Canadian universities. It will well repay your careful study.

Membership entitles you to the *Journal* each month, and this should help you keep up-to-date and abreast of the times in regard to the problems confronting us. In addition you are entitled to attend the annual meeting of the Association, to vote, and may hold office. So, again, why not join today?

A. E. MACAULAY,
Executive Member, N.B. Branch

Dr. E. W. Lunney, of Saint John, has returned following a meeting of the Associated Anæsthetists of the United States and Canada. He is president of this association for the year 1938-39.

Dr. Daniel Toning has established a practice at Black's Harbor, N.B.

Dr. K. A. Baird, of West St. John, is now specializing in allergy and physiotherapy.

Dr. A. L. Gerow, of Fredericton, continues to show improvement following a cardiac attack some months ago.

Dr. F. A. Richard, of Moncton, is slowly convalescing following a serious attack of pneumonia with other complications.

Dr. George White, of Saint John, N.B., read a paper at the recent meeting of the American College of Surgeons entitled, "My experience with the Melhado manœuvre".

Dr. A. E. Macaulay, senior surgeon of the Saint John General Hospital, has been away from home for some time attending the meetings of the American College of Surgeons, Canadian Medical Association Executive, and the Canadian Society for the Control of Cancer. Other representatives from New Brunswick attending the American College of Surgeons were: Drs. V. D. Davidson, C. L. Emerson and D. C. Malcolm.

The Hôtel-Dieu Hospital in Campbellton recently celebrated its 50th anniversary. The order of nursing sisters of the Hôtel-Dieu was established in Canada in 1639. This institution has given a half century of most valued and valuable services to the sick of the north shore of the province. On October 27th the nursing school of the Hôtel-Dieu graduated five nurses.

Dr. L. DeV. Chipman, of Saint John, has been re-elected president of the New Brunswick Branch of the Red Cross Society.

Dr. W. W. White has been elected president of the board of commissioners of the Saint John General Hospital to succeed Mr. Myles Agar, recently retired.

Dr. Ralph Girven, who until recently has practised at River Hebert, N.S., has acquired the practice of Dr. H. L. McKeen at Petitcodiac.

A. STANLEY KIRKLAND

Nova Scotia

At the annual congress of the American College of Surgeons the following hospitals were placed on the approved list: the Victoria General, the Halifax Infirmary, Camp Hill, the Children's, the Grace Maternity, the City Tuberculosis, all in Halifax; Highland View, Amherst; St. Martha's, Antigonish; the Nova Scotia Hospital, Dartmouth; Glace Bay General, St. Joseph's, Glace Bay; Nova Scotia Sanatorium, Kentville; the Aberdeen, New Glasgow; New Waterford General, New Waterford; Hamilton Memorial, North Sydney; the Sydney City, St. Rita's, Sydney; Harbour View, Sydney Mines; the Colchester County, Truro; the Eastern King's Memorial, Wolfville; the Yarmouth Hospital.

A physician, to take up practice in northern Victoria county of Cape Breton, is being sought by the Nova Scotia division of the Red Cross Society. A minimum income is being guaranteed and their hope is that an offer may be forthcoming before the northern winter again cuts off this large community from medical aid.

Awarded their Fellowships at the annual congress of the American College of Surgeons were: Drs. James W. Sutherland, Amherst; John Charles Morrison, New Waterford; Edwin F. Ross, Halifax; Frank J. MacLeod, Inverness; Lewis M. Morton, Yarmouth; Robert H. Stoddard, Halifax. Dr. J. G. MacDougall, of Halifax, was elected a Governor of the College.

Dr. C. W. Holland, of Halifax, addressed the annual convention of the Nova Scotia Home Economics Association on the subject of diabetes.

Dr. John W. Merritt, of Halifax, was admitted as a Fellow of the Royal College of Surgeons of Canada, at the annual meeting in Ottawa.

Dr. V. O. Mader, of Halifax, was elected vice-president of the Defence Medical Association at the association's annual meeting in Ottawa.

Dr. Fred W. Routley, acting national commissioner of the Canadian Red Cross Society, Toronto, was the guest speaker at the annual meeting of the Nova Scotia division at Halifax.

A proposal for the immunization of Truro school children against diphtheria was made to the Board of Health by Dr. F. F. Eaton, Medical Health Officer. Dr. Eaton was authorized to proceed with arrangements for the establishment of a free clinic.

ARTHUR L. MURPHY

Ontario

Dr. C. C. White, of Chatham, has been appointed a coroner for the County of Kent.

Dr. Madge T. Macklin, of the University of Western Ontario, has been honoured with the LL.D. degree from Goucher College, Baltimore, Md., of which she is a graduate.

Dr. Solomon Woolverton, who has been in practice for sixty years in London, on October 22nd celebrated with his wife the sixty-fifth anniversary of their marriage. Dr. Woolverton's parents were both practising physicians. His mother was one of the first women doctors in this province.

Dr. W. E. Gallie, Dean of the Faculty of Medicine of the University of Toronto, was elected a Governor of the American College of Surgeons at its recent meeting.

At the fall Convocation of the University of Western Ontario Dr. E. C. Barnes was given the honorary degree of Doctor of Laws. J. H. ELLIOTT

Saskatchewan

At a recent Saskatoon City Hospital staff meeting Dr. Spencer spoke on "Planigraphy". The method used is the Bocaze modification. Illustrative films were shown; the chief value is in chest pictures. It aids early diagnosis in bronchogenic carcinoma. In discussion Dr. W. S. Barclay said that stereoscopic pictures cannot entirely take the place of planigraphy.

Dr. L. H. McConnell presented two cases of brain tumour. The first was in a man aged 50 whose complaints were drowsiness, staggering, loss of vision, inability to speak; he had no headache and no vomiting, but had bilateral papillœdema and right-sided weakness. The tumour was removed and the patient improved.

The second case was a patient with a right temporal tumour. Both tumours were, pathologically, spongioblastoma multiforme. These are malignant and likely to recur; the prognosis is bad—eight to thirty-six months.

Dr. E. Landa presented a case of torsion of the testicle. This condition is more common than is realized. It is often diagnosed as epididymitis; about a year later atrophy of the testicle makes the diagnosis known. The symptoms are severe pain in the scrotum, exquisite tenderness. There is shock and the scrotum is red and œdematous. At operation the testicle is black and the cord thrombosed. If the testicle is undescended operation should be immediate; if the testicle is descended the testicle may untwist itself; if the tenderness persists more than four days orchidectomy should be done. In epididymitis support gives relief; in torsion support makes it worse. The case presented had hæmaturia, pain and swelling of the left testicle. The onset was sudden. The condition came on during the lifting of a heavy weight; the torsion cord was found at operation.

LILLIAN A. CHASE

United States

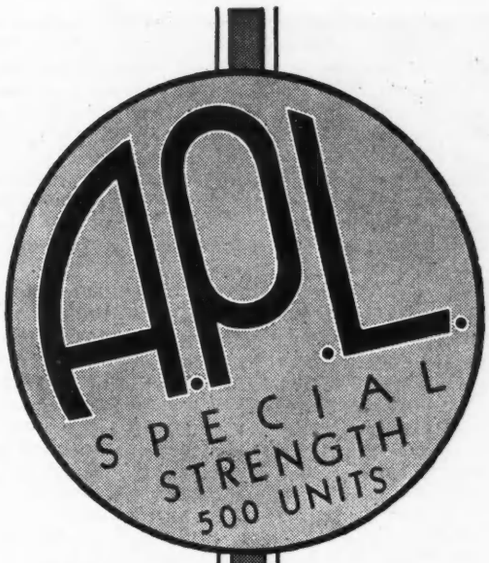
Alvarenga Prize Competition, 1939.—The Premio Alvarenga do Piauhy (Brazil) Prize for 1939 (about $200) will be conferred by the College of Physicians of Philadelphia on July 14, 1939, upon the author either of the best memorial or of the best unpublished essay on any branch of medicine which may be deemed worthy of the prize. In selecting the winner of the award the committee will consider recent publications brought to its attention prior to May 1, 1939; also unpublished typewritten manuscripts submitted to the committee before that date. Manuscripts not in English must be accompanied by a translation in English. Address communications to The Alvarenga Prize Committee, 19 South Twenty-second Street, Philadelphia, Penn., U.S.A.

Air Filter Research at Mellon Institute. — Dr. Edward R. Weidlein, Director, Mellon Institute, Pittsburgh, has announced the establishment of an Industrial Fellowship in that institution by the American Air Filter Company, Inc., of Louisville, Ky. This Fellowship will investigate broadly materials of value in the construction of filters for air-conditioning systems. It will be the aim to gain through this research new knowledge to effect all possible improvements in the devices manufactured by the donor, and in this work the Fellowship will have the direct cooperation of specialists on the staff of the Multiple Industrial Fellowship on air hygiene in operation in the Institute.

General

Dr. Elizabeth Hurdon has resigned from the directorship of the Marie Curie Hospital in London. Dr. Hurdon was born in Cornwall, England, but received her medical education in Canada. She was a student at the Ontario Medical College and received the M.D., C.M. degrees from Trinity University, Toronto (1895). She pursued post-graduate studies at Johns Hopkins University, working under Prof. W. H. Welch in pathology and also under Dr. Howard Kelly. Subsequently she visited the pioneer centres of radium treatment, learning all that was best about the methods adopted to cope with cancer. In 1925 four hospitals, staffed by medical women, were selected to develop a scheme for the control of uterine cancer by radium and Dr. Hurdon was selected as director. In 1925 the four clinics were amalgamated into one unit —the Marie Curie Hospital, and Dr. Hurdon remained as director. The results obtained at this hospital with radium and more recently with x-rays received the commendation of Dr. Henri Coutard as among the best in the world.

Dr. Hurdon received the C.B.E. among the King's birthday honours this year.



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Book Reviews

Osler's Textbook on the Principles and Practice of Medicine. Revised by H. A. Christian, M.D. 13th ed., 1424 pp. $9.00. Appleton-Century Co., New York and London, 1938.

There is a new hand at the rudder of this far-travelled vessel of knowledge. Dr. Christian has taken over the late Dr. McCrae's work, and "Osler" once more is brought up to date. The original author was a man of strong personality, and the succeeding revisions of his book have been carried out by men equally forceful in mind. It is inevitable therefore that each should alter to some extent the original form of the book. That this should have been done with the retention of so much of the writing which makes the textbook unique is a mark of the highest qualities of revision. There still are the passages in which Osler's warmth and strength shine and invigorate. The historical notes are there, indeed supplemented and enriched in places by Dr. Christian, as in the section on syphilis. The rearrangement is extensive. For the first time typhoid fever is removed from its place at the opening and pneumonia is given that honour. The change is perfectly justified in view of the relative frequency of the two diseases nowadays.

A new section is made for Diseases due to Viruses, a change long overdue, and there has been a corresponding shrinkage in the list of "Infectious diseases of doubtful or unknown etiology" which however has additional titles.

All charts and illustrations have been omitted, probably with benefit. The rewriting has been very carefully done and many sentences have been sharpened. Fresh comments from Dr. Christian's rich experience add considerably to the book. There are other textbooks in which the arrangement may be stereotyped, but "Osler" is still a first class textbook of medicine, with Osler's spirit still alive in it.

The Pneumonias. H. A. Reimann, M.D. 381 pp., illust. $6.00. McAinsh, Toronto, 1938.

In his foreword Dr. Reimann states that the book is intended for the general practitioner and the student of medicine. It is designed to emphasize modern methods of classification, diagnosis, prevention and treatment of acute pulmonary infections. The reviewer knows of no recent book which deals with this subject in such a lucid, methodical and comprehensive manner. The illustrations are excellent.

Part I is concerned with specific forms of pneumonia—those due to the various types of pneumococcus and those due to other microorganisms.

Part II deals with pneumonia as a specific form occurring as part of a systemic disease.

In part III the author discusses pneumonia caused by mixed infections and secondary to acute and chronic diseases, mechanical causes, shock, senility, etc.

In the final chapters pneumonia due to allergic, chemical and other similar etiological factors is reviewed briefly. The book is heartily recommended as a valuable reference volume for every practising physician.

The Rheumatic Diseases. Edited by Sir Leonard Hill, M.D., LL.D., F.R.S., and P. Ellman, M.D., F.R.C.P. 270 pp., illust. $3.00. Macmillan, Toronto, 1938.

This volume consists of a course of 20 lectures given under the auspices of the St. John Clinic and Institute of Physical Medicine, London, Eng. The stated object of the book is a practical presentation of the modern conception of the rheumatic diseases, dealing particularly with the early diagnosis and physical methods of treatment. The editors feel that the inevitable divergence of opinion among the different authors is not without merit. Although this may be true for students of rheumatic disease it can not help but add to the present confusion so far as the general practitioner is concerned. For instance, in this group of lectures, rheumatic fever is called at times "rheumatic infection" and again, "acute rheumatism"; while rheumatoid arthritis is called variously, "chronic rheumatic disease", "chronic infective arthritis", and "chronic rheumatism". Still another author groups both rheumatoid arthritis and fibrositis under the single term "chronic rheumatism". It is unfortunate that such inconsistency of terminology exists within the bounds of one volume, because obviously it must detract somewhat from the otherwise valuable information presented.

The first few chapters give an excellent summary of the current views on classification, etiology, pathology, and the social and economic aspects of this vast problem. Succeeding chapters give the views of different authors concerning the probable rôle of various local infections (so-called "foci"). Extra-articular conditions receive considerable attention. A chapter which deals with x-rays is not very extensive, and although comparatively little is said about other laboratory investigations there is a good summary of recent work on antistreptolysins and blood uric acid. Physiotherapeutic methods in treatment are presented in great detail. These include a technical exposition of the physical factors concerned, such as electric currents, heat, light, ultra-violet and x-rays, massage and hydrotherapy. The physiological action of these various agents is discussed as well as the details of their clinical application. Following an outline of the numerous drugs and medications available for treatment, the book closes with an excellent summary of the orthopædic and surgical measures that are required occasionally in treating rheumatic patients.

In spite of many rather dogmatic and unproved assertions by several of the individual authors it must be emphasized that this volume contains a fund of valuable information. Even though it deals primarily with physical methods of treatment the contents are such that all students of the rheumatic diseases should find the book extremely helpful.

British Encyclopædia of Medical Practice. Edited by Sir Humphry Rolleston. Vol. 7, 718 pp., illust. Vol. 8, 664 pp., illust. $10.00 per vol. Butterworth, Toronto, 1938.

Volume 7 continues with an excellent opening article on hyperchlorhydria by Dr. H. Moore. The variety of subjects covered in this and volume 8 is shown by a few samples. Hypnotism; Immunity and Immunization; Intelligence tests; Surgical Diseases of the Kidney; a number of papers on Obstetrics; Lead-poisoning and Leprosy. One notes the excellent introductory sections on anatomy in several of the papers.

Volume 8 continues with a comprehensive article on the Leukæmias, by Dr. Janet Vaughan. Tuberculosis of the Lung is covered by Dr. L. S. T. Burrell. He assigns to radiography the most important rôle in estimating the degree of the disease, but wisely dwells upon the consideration of all the symptoms as of very great importance. The summary on treatment of this disease is excellent.

These two volumes fully uphold the high quality of this Encyclopædia.

Diseases of the Thyroid, Parathyroids, and Thymus. A. Crotti, M.D., F.A.C.S., LL.D., R.I.C.S. 3rd ed., 1129 pp., illust. $20.00. Lea & Febiger, Phila., 1938.

This monumental publication on thyroid, parathyroids, and thymus by a world-famous author represents the labour of many years. It embodies not only the author's own ideas based on his experience with 27,000 medical and surgical cases, but also a very complete review of the best works on the thyroid published up to the present time. About 1,800 different authors are mentioned in the bibliography.

Dr. Crotti has the ability to make a story out of Diseases of the Thyroid Gland, beginning with the



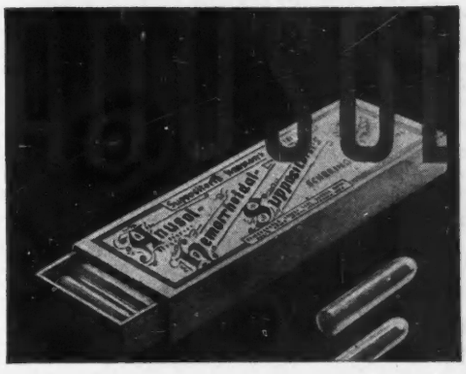
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earliest discoveries in thyroid physiology. His textbook is extremely well organized and as a result extremely easy to read. It is rather difficult to pick and choose the sections of the book that are most worthy of note.

Hypothyroidism and hyperthyroidism are exceptionally well handled, especially the latter. In no other text have the symptoms of hyperthyroidism been more clearly outlined and better explained.

The author is a firm believer that only a *contagium vivum* can explain satisfactorily endemic goitre. In his own personal research work he has isolated a fungus from the thyroid which fulfils Koch's postulates. In addition he has recovered it from goitrogenous water and from cabbage. He is very modest about his "goitre fungus" and frankly admits further work is necessary on the subject.

For the first time in this third edition a section is devoted to the parathyroid glands. It is short, precise, very complete, and very much worth reading.

The section on the thymus has been very well revised and is extremely interesting, even though the average practitioner rarely sees any pathological lesion of this organ.

This publication is well illustrated and extremely well indexed. For those interested in endocrinology and the diseases of the thyroid, parathyroids, and thymus it is a veritable storehouse of valuable information.

Essentials of Obstetrical and Gynæcological Pathology with Clinical Correlation. M. Douglass, M.D., F.A.C.S. and R. L. Faulkner, M.D. 187 pp., illust. $5.50. McAinsh, Toronto, 1938.

The admitted complexity of the pathology of the endometrium and of the ovary as well as of the toxæmias of pregnancy has led to the need of special instruction in this field. The need is particularly felt by interns and residents in obstetrical and gynæcological hospitals and by practitioners interested in obstetrical and gynæcology. The volume under review was written to meet this need. It is the outcome of years of teaching at the Western Reserve University, Cleveland, by Professor Douglass and Dr. Faulkner, and there is a clearness and note of authority in the text and a soundness of judgment in the selection of illustrations which show how good their teaching has been. The pictures are those of normal histology and common pathology, and the text is, for the most part, an explanation of the pictures. This is borne out by the fact that there are 148 illustrations in 160 pages of text. The reproduction of microphotographs is exceptionally clear, the format is pleasing, and there is a good index. The book is worthy of high praise as a faithful exposition of the essentials of the pathology of the female genitalia.

Plastic Surgery. A. J. Barsky, M.D., D.D.S. 355 pp., illust. $6.50. McAinsh, Toronto, 1938.

In the small space of some 300 pages Dr. Barsky has discussed the best practices of plastic surgery. Most of the procedures described are those used by the plastic surgeon in his daily work, and the authorities in this field are freely quoted and acknowledged—Gillies, Davis, Kilner, Ombredonne, Blair, Risdon, Veau, and many others. Thus the whole book has a background of solid well-recognized principles, and this delicate specialty is seen to have emerged as a distinct and solidly founded entity.

General considerations outlined in Chapter I contain fundamental practices in suturing, anæsthesia, and the handling of tissues from which anyone doing any type of surgery could derive benefit. The interest of the general surgeon might also be drawn to Chapter VI on scars, Chapter XII on fractures of the facial bones, and Chapter XIV on orthopædic aspects, such as tendon restoration, chronic leg ulcers, bunions and Dupuytren's contracture.

Like many successful surgeons, the author is inclined to be overly optimistic at times. This is demonstrated by the confident description of mucosal tubes for parotid fistula. But the thorough descriptions and emphasis on certain basic principles lead one to the feeling, too, that if these laws are obeyed success will attend in a high proportion of cases.

This concise, compact survey of the field is the more valuable to the practising surgeon because its size precludes the discussion of merely experimental work. The Langenbeck repair and Wardill pharyngoplasty are described for cleft palate. For facial paralysis Kirschner's strips of fascia lata transplants, masseter and temporal muscle pedicles, and autoplastic nerve transplants are discussed. No mention is made of hypospadias or the construction of an artificial œsophagus. On the other hand, hints regarding the repair of lacerated tendons are most useful.

"Plastic Surgery" can be recommended with confidence to all who practise surgery or attend accident cases.

Syphilis, Gonorrhœa and the Public Health. N. A. Nelson, B.S., M.D., F.A.P.H.A., and G. L. Crain, R.N. 359 pp. $3.00. Macmillan, Toronto, 1938.

This volume is complete in its scope. A description of the venereal diseases and of their diagnosis and treatment is followed by a consideration of their incidence and prevalence, all of which leads up to a well-presented program for their control. The organization of the material is good, the problems are considered from various angles, and the conclusions are realistic rather than idealistic. The book will be of value to those who are engaged in this special field, and to public health and social workers. To the general medical profession it will be enlightening, in that it reveals the difficulties of the public health department and the clinic, which difficulties should be understood by the medical practitioner in order that he may work more effectively with the official department and the clinic.

The Biology of Arteriosclerosis. M. C. Winternitz, M.D., R. M. Thomas, M.D. and P. M. LeCompte, M.D. 142 pp., illust. $4.00. C. C. Thomas, Springfield, 1938.

The causation of arteriosclerosis is still obscure. We speak easily of "toxins" being associated with it, but we have not enough evidence to establish their influence. The toxin of syphilis is of course known to cause a definite type of arteritis, but that is not arteriosclerosis. This book is a careful and detailed investigation from the morphological point of view. The authors have tried to elucidate the part played by the vasa vasorum, and they show that these vessels are very extensive. When these are more completely described it is felt that we shall have a clearer understanding as to how disease reaches the vessel. It is emphasized that the cause of arteriosclerosis is probably not to be found in one factor only. The illustrations are so magnificent that they tell the story of the work almost by themselves.

The book is to be strongly recommended.

The Etiology of Trachoma. L. A. Julianelli, Ph.D. 248 pp., illust. $3.25. Commonwealth Fund, New York, 1938.

For many years there has been a decided need for works dealing with the etiology of trachoma which would incorporate the advances in our knowledge in this very difficult field. Dr. Julianelli's monograph admirably fills all the requirements. He deals with his subject in an orderly, concise manner, manifesting a full and detailed acquaintance with the experimental background, which makes his book not only instructive but intensely interesting. He begins with a brief but sufficiently full description of the clinical manifestations and histological findings in trachoma and its allied diseases, and develops his subject into the fields of etiology and experimentation. He concludes with an extraordinarily full bibliography, covering no less than forty-five pages.

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In a large proportion, which amounts to well over fifty per cent, of cases of lobar pneumonia, the causative agent is a Type I or a Type II pneumococcus. Serum therapy of pneumonia caused by either of these types of the pneumococcus had become, by 1934, so wide-spread that international units were then adopted for standardization of Type I and of Type II anti-pneumococcus serums.

Now, following investigations initiated by Horsfall and colleagues at the Hospital of The Rockefeller Institute for Medical Research, it is possible to prepare specific anti-pneumococcus rabbit serums for use in lieu of or in comparison with the corresponding equine serums which have been available for some years. Clinical trial of these rabbit serums has yielded most promising results, and, at least in the use of the Type I and the Type II rabbit serums, the results now warrant regular supply of these serums.

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Surgical Anatomy of the Head and Neck. J. F. Barnhill, M.D., F.A.C.S., LL.D. 921 pp. $20.00. William Wood, Baltimore, 1937.

This book consists of a series of lectures intended to accompany actual dissections carried out on the head and neck. These discussions are for the most part amplifications of operations commonly performed in these regions. The book contains a great mass of interesting facts and some very original ways of presenting these. It will undoubtedly be of great value to any beginner in the surgery of these regions. The book is well printed and excellently illustrated.

Refraction of the Eye. A. Cowan, M.D. 319 pp., illust. $4.75. Lea & Febiger, Phila., 1938.

Several books on the refraction of the eye have appeared in the last few years. This one is fully up to the standards of the best. The theory, as well as the practice, of refraction is completely and clearly dealt with. The mathematics of refraction is a subject full of terror to the average ophthalmologist. However, in this book its presentation is so clear and well ordered that much of this reaction is removed. The illustrations are well executed, timely, and to the point. Included also are descriptions and the theory of operation of the various instruments used in determining refraction, as also the construction of the various lenses. Our main criticism is that not enough space is given to the subject of muscle imbalance in its relationship to eyestrain and its importance in connection with the final prescription of glasses. Although this book is too detailed for the beginner in refractive work it should have a place in the armamentarium of every ophthalmologist who takes pride in the scientific prescription of correction in refraction.

Diseases of the Nose, Throat and Ear: Medical and Surgical. W. L. Ballenger and H. C. Ballenger. 7th ed., 1030 pp., illust. $11.00. Lea & Febiger, Philadelphia, 1938.

In this edition the material has been rearranged, obsolete matter has been eliminated, and repetition has been avoided. Every page has been subjected to a careful and searching revision; many old illustrations have been replaced by new ones. The authors have been assisted by certain well-known specialists in the subjects of peroral endoscopy, bronchoscopy, and gastroscopy (Drs. Gabriel Tucker and C. L. Jackson). Dr. Alfred Levy has revised his section of the physiology and functional testing of the labyrinth and the indications for the labyrinth operation. Dr. J. M. West has described his operation for dacryostenosis and has discussed the subject in general. The various subjects are well arranged and each system is discussed after a preliminary statement in regard to its anatomy and physiology.

Under the heading, Allergy, asthma is dealt with, but the authors do not tell us anything new. We would wish to have some statement as to the value of operative measures, for example, in regard to the antra and sinuses. Cleft-palate is not dealt with. Surely, inasmuch as the nasal cavity is involved in this condition, surgical intervention could, logically, have been discussed, much more logically, indeed, than to take up space with Gastroscopy, which subject seems to us to have been dragged in. Under Ozæna the very suggestive work of Mortimer, Wright and Collip in reference to its etiology is not referred to. Reference, however, is made to other excellent Canadian work, namely, that of Tait and McNally on the labyrinth and the subject of equilibrium. On page 325, under Indications for Removal of Tonsils, we find, as the third indication, "When an acute attack of tonsillitis is followed by such complications as rheumatism or heart trouble." We do not think that the majority of physicians, especially those chiefly interested in rheumatism, would endorse this "indication" as so baldly stated. No doubt, in a few carefully selected cases tonsillectomy may properly be advised, but at the moment the advice seems to be in the great majority of cases to leave the tonsils alone.

Chapter XXXIV is entitled "Surgical Treatment of Malignancies of the Larynx". We regret to find that the authors have lent their influence towards the perpetuation of an inaccuracy of language which seems to be gaining ground. We refer to the use of the term "malignancy". "Malignancy" is a *quality* or property and not a *material* thing. It refers as much to infection as to cancer. We commonly speak, for instance, of "malignant sore throat" or "malignant endocarditis". To use "malignancy" instead of "cancer" is to divorce the word from its other important connotations. "Malignancy" is abstract, "cancer" is concrete. The mistake is of the same order as another popular one—the use of "pathology" when "lesion" is meant. When "cancer" is meant why not say so?

Apart from all this, however, the book is well arranged and well written. The descriptions are clear, for the most part adequate, and the illustrations really illustrate. The book can be commended.

Textbook of Pathology. W. Boyd, M.D., LL.D., M.R.C.P., F.R.C.P., F.R.C.S. 3rd ed., 1064 pp., illust. $10.00. Lea & Febiger, Philadelphia, 1938.

This latest edition has had much added, such for example, as new material on the method of invasion in typhoid fever; the etiology of arteriosclerosis; the grouping of the hæmolytic streptococci, etc. A new section on "Sudden Death" has been added, and various subjects have been rewritten. The high standard of the book is fully maintained.

The Horse and Buggy Doctor. A. E. Hertzler, M.D. 322 pp., illust. $2.75. Harper Bros., New York, 1938.

This book is one of the most interesting of the group of semi-personal, semi-professional works coming from the experiences of practitioners of regular medicine. The paper is of excellent quality; the composition is free and easy, yet of exact definition. The illustrations are on the whole of a humorous nature. Coming from the pen of one who has lived the whole gamut of medical practice it will probably be read by many who have enjoyed their own experiences. To the novice it opens a field, perhaps awesome, yet surely stimulating and with an intrigue of its own. We rather think the average medical student will treasure this book and will find it gives him courage to face his early years of practice. As an historical manuscript it graphically depicts the desire of a man who wished to practise fully the art and science of healing human ills, and one whose progress in that journey went hand in hand with the developments of hospital practice as we see it now. There is substance for sober thought and a goodly number of chuckles.

BOOKS RECEIVED

International Clinics. Edited by G. M. Piersol, M.D. Vol. 3, series 1 (old 48th). 341 pp., illust. $3.00. J. B. Lippincott, Montreal, 1938.

Alcohol, One Man's Meat. E. A. Strecker, A.M., M.D., Sc.D. and F. T. Chambers, Jr. 230 pp. $2.50. Macmillan Co., Toronto, 1938.

Pathology of Diabetes Mellitus. S. Warren, M.D. 2nd ed., 246 pp., illust. $4.75. Lea & Febiger, Phila., 1938.

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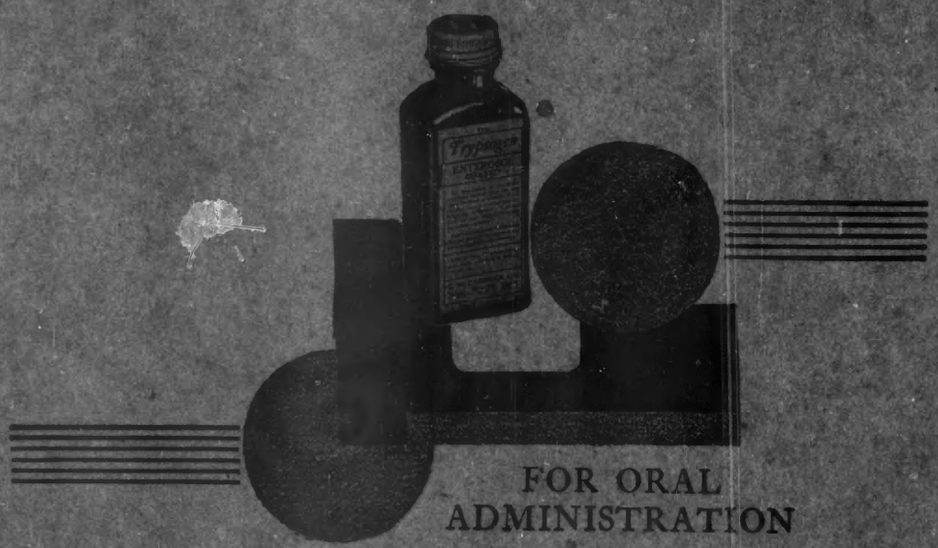
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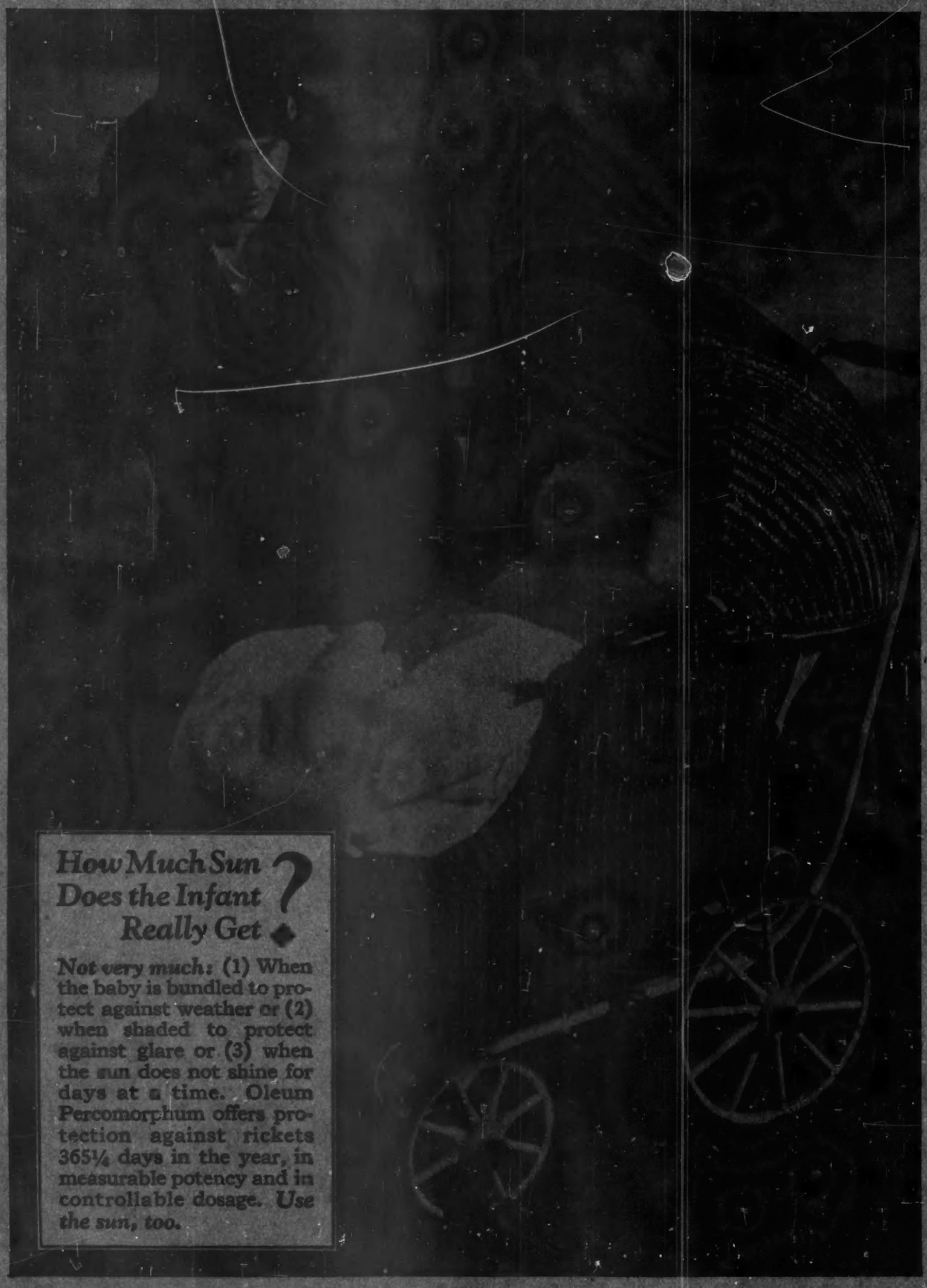
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